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PARKS A NECESSITY, NOT A LUXURY

They Make Better Citizens, Raise the Moral Tone of a Community, and Increase the Value of Real Estate—The Park System of Wilmington, Del., Well Adapted to This End

*By Theodore Alfred Leisen, C. E., Mem. Am. Soc. C. E.**

PARKS are looked upon by many, not as a necessary factor in the economics of the municipality, but as unessential luxuries, to be given consideration only after the more strictly utilitarian affairs have been provided for.

The real value of a community is measured by the gauge of its innate nobility, and all that tends toward raising this standard, increases its intrinsic value, and where this standard can be raised, the model of citizenship will be lifted with it, and better civic government will unquestionably prevail.

THE TRUE FUNCTION OF THE PUBLIC PARK

The true function of the Public Park is to elevate the moral and physical standard of the people by affording opportunities for a closer communion with and a more intimate knowledge of the beauties of nature, with the consequent and inevitable uplifting of their moral

tone, providing at the same time for their physical welfare, by the inducement to exercise and outdoor life which the shady woods invite and cultivate, affording relief from the turmoil of business, complete change of air and scene from the congested condition of city life, a restfulness which the quiet of the forest alone can give.

For the furtherance of these purposes the two essentials of the park are proximity to the residential portion of the town and natural wooded landscape. These two conditions are admirably exemplified in the Park system of Wilmington, as a knowledge of its boundaries and topography will conclusively show. The large parks, which form the main system, contain two hundred and forty acres and comprise the valley of the Brandywine and a portion of the high level land in the westerly part of the city. Commencing at Market Street, the principal business thoroughfare, the park land extends westwardly to the boundaries of the city, a distance of more than two miles, and the expansion of this very limited area over a long narrow space,

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A SHELTER PAVILION IN ONE OF WILMINGTON'S PARKS

makes it readily accessible to a very large proportion of the citizens, without recourse to street railways,—an item which many a poor man with a large family, duly appreciates. Of this area, probably two-thirds is wooded land, broken in contour, with rocky projections jutting out here and there, exhibiting all the elements of the primitive forest, miles distant from civilization. A further evidence of this unique condition is that within about a thousand yards of the Court House at Tenth and Market Streets, which may fairly be considered as the heart of the city, one can lose himself absolutely from all sight and sound of city life; away from the monotonous rows of houses and busy streets with their attendant bustle, into the depths of the primeval forest, with naught to distract one's thoughts and musings; no sounds save the sighing of the leaves, or the ripple of the water in the near by stream. Here, then, is the fulfillment of the essential conditions of the Public Park.

SHOULD ALSO FOSTER LOVE OF OUTDOOR SPORTS

Another important element which the Public Park should foster is the love of outdoor sports, and to this end ground should be secured to meet the requirements. Owing to the hilly topography of the ground along the creek, there is little available space for athletic

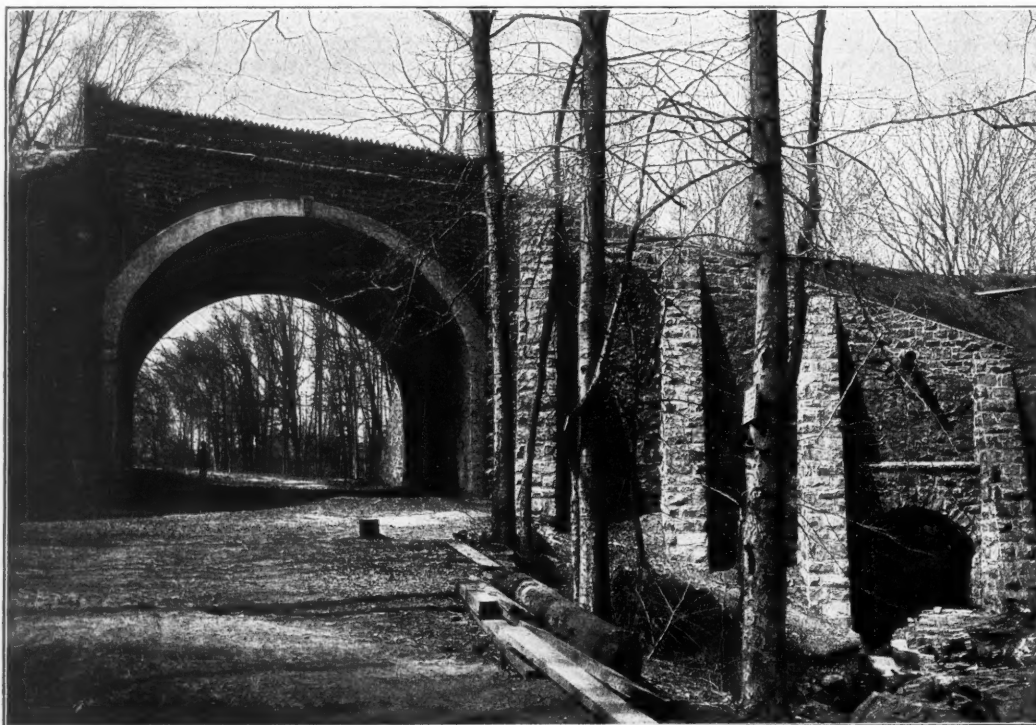
in Rockford Park at an elevation of two hundred and fifty-two feet above tidewater. The total length of the drive is about three miles, and its width, with a few exceptions, thirty feet throughout. It is macadamized throughout.

EXCELLENT FEATURES IN THIS SYSTEM

At some points along the road vistas have been cut out, from which are obtained glimpses of Brandywine Creek and the surrounding country. The views from the higher level in Rockford Park are superb, and acquire added charm from the fact, that, while the range of vision carries miles beyond the park limits, there is scarcely a sign of habitation or other obtrusive artificial features to mar the natural beauty of the landscape.

On the north side, a good road runs along the lowlands near the creek, but is practically disconnected from the other drive. A bridge across the Brandywine will at some future time remedy this defect.

Footwalks are being constructed each season, and gradually a general system is being carried out which will reach all the interesting points and make them more accessible. Shelters and pavilions are also being built in the various parks as the necessity becomes apparent, and funds will permit.



THE RECONSTRUCTED CLAYTON STREET BRIDGE, IN WILMINGTON'S PARK SYSTEM*

sports and outdoor games in the Brandywine Park, although a limited area in North Brandywine Park is set apart for such uses, and though it lacks much of being an ideal field, yet the large and constant patronage indicates that it is properly appreciated.

In Rockford Park, however, the conditions are much more favorable in this particular, and while this section is not quite so accessible, neither is it so distant as to deter the devotees of base ball and foot ball from congregating there throughout the respective seasons for these games.

While the parks of Wilmington have been richly endowed by nature, they have not been equally favored financially, hence the exhibit of improvements does not compare as favorably as would be desired. Owing to the irregular contour of the land traversed, the construction of the main drive was an expensive undertaking. It extends from end to end of the parks south of the Brandywine. The principal entrance is at Market Street, where the elevation above tidewater is twenty-five feet. For about a thousand feet the width of the land available was little more than sufficient for the roadway, and in order to obtain even this width, the construction of massive retaining walls became necessary. A little farther west the park land widens, and the driveway then enters the woods and keeping higher up on the hillside, by the steady gradual ascent reaches the summit

The Observatory which is now completed, is a feature worthy of special mention. It is situated on the extreme summit of Rockford Park, the highest point of land within the city limits, and affords the means of viewing the surrounding country to much better advantage than heretofore.

The small parks and squares call for no special comment. They fulfill their mission of supplying breathing spaces to inhabitants of the congested districts, and are valuable and indispensable adjuncts to the larger parks, and jointly with them they tend to benefit the health and moral tone of the community, and ignoring the more sordid but well proven fact that they also increase the wealth of the city; these alone are sufficient reasons for their existence in Wilmington as elsewhere.

* This bridge was reconstructed last year on plans and specifications calling for concrete-steel arch, abutments and superstructure, at the contract price of \$3,900. The buttresses to the wing walls were built by day labor under the direct supervision of the Park Engineer. The material used was the best quality of rubble masonry, nearly all derrick stone, laid in Portland cement, and bonded into the old wall with headers where feasible and with steel bars at other points. There was, in all, about 260 cubic yards of masonry, the cost of which, including excavation, tearing out old work, insertion of steel bars and I beam over arch culvert, was \$1,690.48. The total cost of the new structure will probably not exceed the original estimate of \$6,000.—[EDITOR.]

THE MAINTENANCE OF ASPHALT STREETS*

Many Failures in This Country—Successful Use of Rock Asphalt in Europe—Practice in American Cities—Specifications Used by Mobile

By James N. Hazlehurst, M. Am. Soc. C. E.

SINCE the impetus given to improved road making, through the genius of Macadam and Telford, nothing has quickened the interest or added more to satisfactory results in highway construction than the introduction of natural bituminous concrete or asphalt as a surfacing material. Appearing as a practical utility simultaneously in Berlin and in Washington, about 1876, its remarkable popularity is attested by a bulletin issued by the United States Department of Labor in 1900, reporting 30,203,946 sq. yds. of asphalt laid in 129 cities in this country having a population of 30,000 inhabitants. When it is recollected that this represents an outlay of approximately \$75,000,000, in initial cost and expended during the last 25 years, the enormous proportions of this industry are apparent.

Notwithstanding the great popularity of this class of pavement, both in this country and abroad, its introduction has been attended

mous Minister of Public Works. Not only did it afford the means of securing a handsome, sanitary and comparatively noiseless pavement, but its continuity and difficulty of removal made it of little use for the formation of barricades by the turbulent element of the population, and thus contributed greatly to the preservation of law and order by the municipal authorities. Its use in most of the principal streets and avenues soon followed, but with the increased demand came competition and numerous attempts to reduce the cost by the substitution of inferior materials and methods, until finally the quality became so poor as to lead to early disintegration. This result became generally noticeable in Paris about 1880, and in consequence of the inability of the contractors to make proper repairs, asphalt pavements fell into serious disrepute.

"In relation thereto, M. Leon Malo, the well-known French paving



ANOTHER BRIDGE IN WILMINGTON'S (DEL.) PARK SYSTEM

with many expensive and disastrous failures, as a reason for which, E. Kuichling, M. Am. Soc. C. E., in a recent article (in the MUNICIPAL JOURNAL AND ENGINEER), cites the following:

KUICHLING ON PRACTICE IN EUROPEAN CITIES

"It may also be mentioned that rock asphalt for street paving purposes was first introduced in Paris in 1854, and that its advantages were promptly recognized by Baron Hausmann, Napoleon III's fa-

* This article, "The Maintenance of Asphalt Streets," by James N. Hazlehurst, M. Am. Soc. C. E., was first published in the American Society of Civil Engineers Proceedings, Vol. XXVIII, No. 5, May, 1902, beginning on page 428, it having been presented to the Society September 17, 1902. Copyright, 1902, by American Society of Civil Engineers. As this is the beginning of a most valuable discussion upon the question of the maintenance of asphalt streets, the MUNICIPAL JOURNAL AND ENGINEER has secured permission from the American Society of Civil Engineers to re-publish the original paper and discussions, the first installment of which appears in this number and will be continued until the series is complete. This will not be new matter to most of the city engineers, as they are members of the American Society, but it cannot fail to be of great interest and assistance to the mayors, heads of departments, and boards of aldermen who are not familiar with the proceedings of that society. We commend the series of articles to their careful perusal.—[EDITOR.]

expert, and director of the rock asphalt mines at Seyssel, which are controlled by the General Asphalt Company of France, states that up to 1876, all the asphalt pavements of Paris were built and maintained by said company under contract, and gave entire satisfaction. In that year, however, the contracts expired, and the municipal authorities yielded to the pressure brought by rival paving corporations to open the work of construction and maintenance to general competition, and award the contracts to the lowest bidder. The consequence was that the work was taken at low prices by inexperienced firms, and performed improperly, as mentioned above. In the course of five years over 240,000 sq. yds. of the inferior asphalt pavement crumbled, and the contractors went into bankruptcy, leaving repairs of enormous extent undone and creating widespread prejudice against this kind of pavement. The authorities then realized that such work could not be done in a haphazard manner, and thereafter gave contracts only to the most experienced and responsible firms, under strict inspection, and limiting the source of the bituminous rock to a few quarries of established reputation."

The experience of the French capital is not an isolated case, many

cities on both sides of the Atlantic having successively faced and decided, each for itself, the advisability of restricted competition or untried materials.

THE WORK STILL LARGELY EXPERIMENTAL

In engineering works, "what is wanted" is generally so clearly understood that there is no difficulty either in readily specifying or exactly following the requirements. The strength, durability and composition of the great mass of materials entering into constructive engineering works have, for the most part, been long and well understood, and their exact values determined experimentally and practically under a wide range of conditions and tests, but to this rule there are certain notable exceptions, where materials are used singly or in combination with others for certain important work, but where the individual character and resulting combination is made without sufficient scientific knowledge to make certain prediction of successful use.

Such a material is bitumen, the essential base of all asphalt pavements. Bitumen, in mineralogy, is defined as "a hydrocarbon mixture, of mineral occurrence, whether solid, liquid or gaseous," and, in line with this, the Supreme Court of the United States has ruled that natural gas is a true bitumen; other chemists and mineralogists are inclined to include "any and all hydrocarbons, whether natural or artificial, provided they be soluble in carbon bisulphide"; hence, in specifications where the percentage of bitumen is a ruling consideration, either natural gas or coal-tar would be equally suitable for the production of an asphalt pavement.

Asphalt is a hard, natural bitumen, and is found in Nature in great deposits such as the pitch lake at Trinidad, or impregnating both lime and sand rock. Not only does uncertainty exist in the classification of bitumen, but, in analytical chemistry and physical test, the differentiation of asphalt and coal-tar is most uncertain. To the chemist, the diamond and the lump of coal are both carbon, while coal-tar and natural asphalt are bitumens, almost impossible to determine, the one from the other, except by the smell.

WHAT THE WEARING SURFACE SHOULD BE

The wearing surface of the asphalt street should be a true concrete, in which sand is the aggregate, while carbonate of lime dust and the asphalt form the matrix. As with hydraulic concrete, it is important that all voids in the mass be filled, and that asphalt, the cementing ingredient, shall be of proper composition and quality, to the end that the concrete thus formed is durable, tenacious and elastic. While all asphalt is bitumen, all bitumen is not suitable for an asphalt pavement; it may be too brittle or may lack the requisite cementing properties, in which case the pavement necessarily disintegrates and fails. Again, even with the best of materials, the composition may be spoiled in the making, too much of the limestone dust making the pavement hard and brittle, while too great a quantity of asphalt cement will make a soft and yielding surface, in summer, sometimes being so soft as to mire teams, in either case making a renewal of the wearing surface of the pavement a necessity; so that it would seem that the surest way of securing satisfactory results and determining the merits of an asphalt pavement is to give it a trial, requiring considerable time, and to award the execution of the work to experienced asphalt contractors and road builders.

In view of the negative value of tests, except that of long experience the only specifications likely to produce reliable and exact results, are those which incorporate in their requirements formulas and methods adapted to materials which have previously been used successfully, as made evident by from fifteen to twenty years of steady use under ordinary street traffic, but even the adoption of such well-tried and successful materials and methods is not a positive guarantee of the merit of the asphalt proposed to be laid, for careless manipulation and unaccustomed climatic conditions may make an inferior pavement of materials which have been used successfully elsewhere, while restricting competition to those materials the fitness of which has been established by long use necessarily reduces competition, offering inducement to collusion, combination and fraud; besides, there is lost the possibility of introducing through experiment a material superior to any so far presented for service.

NECESSITY FOR BROADEST COMPETITION

Such considerations suggest the necessity for the broadest competition, and the free exercise of this principle by municipalities is most

commendable and, in general, is certainly the true public policy. However, it is equally true that the taxpayer should be at all times protected against the possibility of expensive failure, where inferior or untried materials and methods are permitted to compete upon the same basis with those which from long experience have fully demonstrated their fitness for particular use; and it is obvious that the safe course, under such conditions, is to insist that the burden of responsibility and the cost of full and free experiment be placed where it properly belongs, upon the promoter of the new material.

Were it not for a legal obstacle, to be hereinafter discussed, it would be a simple solution of the difficulty to require a solvent bond for performance and a long period of maintenance.

Unfortunately, any long-term guarantee is likely to be subject to sharp and repeated attacks before legal tribunals, with every chance of having assessments defeated or declared invalid because of the incorporation, in paving contracts, of a clause requiring the contractor to guarantee and keep in repair, for a long-term period, the work executed by him.

The contention has frequently been sustained by the highest courts of the land that such requirement, unless clearly set forth and intended by the act providing for paving assessments, works an unexpected hardship upon the abutting property owner, who is not only compelled to pay for all or a proportion of the cost of paving in front of his property, but is charged besides with the maintenance of the street in good order for a definite period of years under the so-called "guarantee" clause of the contract, which is, in fact, only a maintenance charge in disguise; an expense which should clearly be assessed against the taxpayer at large, responsible for the proper care and repair of all streets and public places, there being no sanction in the statute or act for putting this expense upon the property owner.

CONDITION OF THE GUARANTEE

The Supreme Court of the State of Louisiana, on May 29th, 1899, handed down a far-reaching decision, which, in part, held that:

"The maintenance clause in the contract, by which plaintiff company binds itself to keep the street in good order and condition for a term of five years, must be construed with reference to the specifications for the work, and the bid of the plaintiff thereon."

The latter contained the guarantee:

"That the work should be constructed in such manner that the same would endure without requiring repairs for five years, but that, if repairs should become necessary, plaintiff company would make same at its expense. It thus appears that plaintiff's undertaking was to lay paving consisting of such materials, and put down in such manner, as to endure for five years without repair, and it guaranteed its work to be of such character. If not of such character, the loss would fall on the company, at whose expense the repairing needed within five years would be done. This clause is not legally objectionable. It is regarded as simply a guarantee of the quality of the work contracted to be done, and does not render the contract void, as increasing the burden of abutting property owners by requiring them to pay for keeping the pavement in repair for the period of five years after its completion. It is an incident of the contract, not an independent undertaking."

There must be some point, however, where such an obligation for maintenance does not become an "independent undertaking," and that point is conceived to be that period of time within which the well-laid asphalt pavement should continue without requiring repairs incident to the wear of ordinary traffic.

A consideration of the department reports of some of the larger cities shows that in the great majority of cases the maintenance of asphalt pavements is provided for by the contractor under the "guarantee" clause for a period of about five years, hence the impossibility of obtaining from the records an approximation of the cost of providing for necessary repairs during such time, but, from reliable authority, it seems certain that the contractor never anticipates the necessity of repair of asphalt pavements, except for accidental cause, during a five-year term; hence that period might properly represent that specific time when maintenance becomes more than "an incident" of the contract cost of paving.

GUARANTEE AT HOME AND ABROAD

Referring to the experience of Paris, it would appear that about the same period was required before inferior pavements disintegrated

to a point necessitating removal; hence it is questionable whether that period of time taken to represent a reasonable guarantee is sufficient to test fully the life expectancy of the asphalt pavement. If this contention is accepted as true, the wisdom of the German municipalities is unquestioned. Their contract requirements for asphalt pavements being that the new pavement shall be kept in perfect repair for a period of nineteen years, beginning on April 1st of the year following the completion of the work. During the first four years the contractor receives no compensation whatever for necessary repairs, but for the remaining term of fifteen years he is paid at the rate of 10 cents per square yard for the entire area under contract.

While the practice in the United States is to omit altogether any provision for long-term guarantees by the original contractor for asphalt pavements, in a few instances, subsequent and supplemental contracts for such repairs have been entered into by municipalities, and include periods ranging from five to ten years in addition to the time of the original guarantee.

The City of Omaha, Neb., has made such a contract, for ten years, at the rate of 8 cents per square yard per annum; Denver pays 10 cents per square yard for a like arrangement, while Cincinnati, subdividing the term into two periods of five years, has contracted for the repair of its asphalt pavements at 7½ cents for the first five years and 14 cents per square yard for the last five years, in all, fifteen years of guarantee or maintenance.

Under the European system, providing for the maintenance of asphalt street at a fixed sum per square yard per year, such bonus, payable annually, depends only upon the extent of the area under contract and not upon its legitimate and natural repairs, the effect being that the contractor receives a sum for repairs whether he earns it or not, the sum paid representing the premium upon an insurance policy rather than an expenditure for a real necessity.

The practice of a few American cities, in providing for the maintenance of streets by subsequent additional and supplemental contracts, not necessarily with the original contractor or for identical material, might be so amended as to provide that the first contractor should continue to keep his work in repair, with materials previously used, the payment for which being based upon original prices, and due only where there is a real demand for repairs and a consequent outlay.

From the department reports of Washington and Buffalo, the cost of repairs and maintenance was guaranteed by the contractors for five years. The subsequent expense to each city is averaged as follows:

WASHINGTON

First period of five years.....	0 cents per square yard per year.
Second " " "	29 " " " "
Third " " "	73 " " " "

BUFFALO

First period of five years.....	0 cents per square yard per year.
Second " " "	6 " " " "
Third " " "	48 " " " "

Accepting the figures showing the cost of maintaining pavements in Washington as a basis, and rounding them out to 3 cents and 8 cents, respectively, and accepting the logical consequence of the preceding argument, it would seem perfectly possible and proper to draft specifications so as to permit open and broad competition, under a sufficient and proper guarantee, and in such manner as to comply with the rulings of the Courts in the matter of maintenance, by stipulating that the contractor should lay the pavement at a price to be agreed upon and to be assessed against the responsible parties under the act providing for pavement assessments, but requiring the contractor to provide a solvent bond, not only for performance, but for the maintenance of the work in good condition for a term of years, and for compensation which, from the record of other cities, might seem proper and reasonable. The cost of maintenance, thus determined and agreed upon in advance, should be paid annually, only when earned, to the contractor, out of the general city funds, for all legitimate repairs, and at the price previously agreed upon, but any excess of cost, greater than that which the record of other cities has shown to be a proper and just amount of repair work for well-laid asphalt pavement, should be assessed against and paid for by the original contractor.

For the reason that neither the chemist, mineralogist nor engineer can specify with certainty the character, amount or composition of an asphalt pavement, and as results and not precise methods are sought, it would seem reasonable to relieve the contractor of specific limitations while requiring that the entire responsibility for the success or failure of the pavement be borne by him, through stipulation with security that the particular pavement shall last as long and require as few repairs as other well laid asphalt pavements; and that the reasonable cost of legitimate and necessary repairs should be paid annually, after five years, to the contractor, by the city at large; while any sum expended in excess for necessary repairs should be a charge against the contractor.

In line with the preceding argument, the writer drafted for the Department of Public Works, of Mobile, Ala., a set of specifications from which the following is taken :

SPECIFICATIONS FOR ASPHALT PAVEMENTS

"Wearing Surface.—Upon a concrete foundation, or 'binder course,' previously prepared, there shall be laid a wearing surface of asphaltic concrete, composed of natural bitumen, silicon and carbonate of lime, of such proportions and composition, and mixed according to such formula, as may be recommended by the contractor, who shall furnish, with his proposal, the chemical analysis of the asphalt to be used on the work; also, a statement of the ingredients and proportions thereof; and the method of mixing and laying. This material shall be spread and rolled to a finished depth or thickness of not less than 1½ ins., where a binder course is used, and not less than 2 ins. where such course is omitted, and in such manner and by such means as the contractor may deem expedient or likely to produce the best results.

"Concrete made of asphaltic cement and clean gravel may be used to form the binder course; its thickness shall be considered as part of the depth specified for cement concrete, and will be paid for as such.

"For a period of fifteen years, immediately following the acceptance of the work contemplated under these specifications, the cost of maintaining the pavement in good condition shall be guaranteed by the contractor, not to exceed the following rate for each square yard of pavement for the following periods:

"For the first five years, cost per yard for each year..... 0 cents.

"For the second five years, cost per yard for each year.... 3 cents.

"For the third five years, cost per yard for each year.... 8 cents.

"The maintenance of the pavement in good condition during the guarantee period contemplates, and is intended to provide only for, repairs which may be necessary by reason of defects in the wearing surface of the pavement, made apparent by conditions of weather and traffic. Noticeable irregularities of the wearing surface; cracks exceeding ¼ in., and apparent disintegration, all extending over more than 1 sq. ft. of surface, shall be considered cause and necessity for repair, which shall be made and estimated as follows:

"Guaranteed Annual Cost of Maintenance of Pavements.—After a pavement has been laid and accepted, and the cost of maintenance guaranteed at any time during the term of such guarantee, when, in the opinion of the Board of Public Works, and in accordance with the foregoing requirements as to maintenance, the necessity exists for repairing any portion of the pavement, upon notice from the Board, and within fifteen days thereafter, the contractor shall take up, relay or repair such portion of the pavement as may have been designated, and shall repair or relay the same with materials and according to methods prescribed for the original work, and to the satisfaction and acceptance of the Board of Public Works.

"For the purpose of estimating the value of such repair work, in addition to the contract price per yard as established by the original bid, there shall be allowed an extra amount for such repairs, as follows:

"For each separate amount, as ordered, less than 20 yds., 20 per cent.

"For each separate amount, as ordered, more than 20 and less than 50 yds., 15 per cent.

"For each separate amount, as ordered, in excess of 50 yds., 10 per cent.

"Should the cost of repairs, as estimated above, exceed in any one year the sum for which the contractor has guaranteed that such pave-

ment could be maintained, any additional work, ordered by the Board of Public Works, shall be done by the contractor, under the terms of the specifications, and without cost to the city.

"If, in the opinion of the Board of Public Works, there should arise the necessity for removing, repairing and replacing any section of the pavement for the laying of water, gas or other mains, or for the repair of same, or for any purpose whatsoever, upon the written order of the President of the Board of Public Works, the pavements shall be opened, replaced or repaired by the contractor, in the manner and under the terms provided for repair work, but the

cost of such work shall not be charged to the contractor, or considered as a part of his guarantee."

Under the provisions of the foregoing specifications and the penalty expressed in a bond in the sum of \$15,000, contractors for asphalt paving have recently undertaken some 17,000 sq. yds. in the City of Mobile, Ala., for the following prices:

A.—Construction of 6-in. concrete foundations, including grading, 65 cents per square yard; B.—Paving with asphalt, \$1.15 per square yard.

(To be continued.)

PRACTICE IN LAYING BRICK PAVEMENTS

Too Much Care Cannot Be Given to the Foundation—Slight Difference of Opinion as to the Sand Cushion—Great Stress Laid Upon the Choice of a Filler and Its Application

VITRIFIED brick, like all other forms of street paving material, has had its ups and downs, but it has long since passed the experimental period. It is not well adapted to all sections of a city; in fact, there is no single pavement which possesses such varied qualities as will permit its use with equal success and satisfaction under all condi-



VIEW OF BRICK PAVEMENT, WHITE PLAINS, N. Y.*

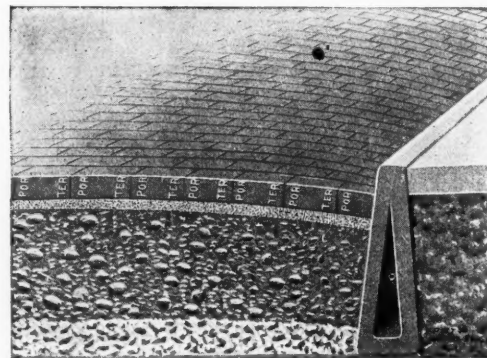
tions. Brick makes an excellent pavement for residential streets and those having a light traffic. It is not suitable for heavy grades, as it does not afford sure enough foothold for horses. It is a smooth, clean, sanitary, cheap and durable form of pavement, easily laid and maintained without expensive repair plants such as are used for laying Trinidad Lake sheet asphalt pavements. The average city engineer is generally capable to construct and keep in repair such pavements. There are a number of cities which make a practice of purchasing their own material and laying their own brick pavements, claiming that it can be done more economically than by the contractor.

LAYING THE FOUNDATION

Many of the failures in brick pavements have been the fault of the contractor, because they have been improperly laid. In its infancy

the brick paving industry suffered setbacks because of the too frequent inclination of experimenting, but the art of constructing a first class brick pavement has become so generally known that pretty much the same methods are employed by every engineer.

The majority of engineers place great importance upon the foundation, and justly so. After the street has been reduced to grade, the earth is thoroughly rolled and tamped until the surface of the road-bed is firm, hard and compact. If any depressions occur under the rolling they should be properly filled in with sand or other suitable material and re-rolled. If the character of the ground renders it necessary, an efficient method for draining the soil under the foundation should be adopted. Upon this hard rolled surface is to be laid the foundation, which is to support the paving surface. This generally consists of a layer of concrete, from four to six inches deep. In some cases a very durable pavement may be formed by laying the brick upon a bed of thoroughly rolled sand. In other cases broken stone, cinders, etc., may be used. A sand foundation in localities where the underlying soil is hard, clean sand, containing little or no loam, is proving highly satisfactory in many cities along the southern coast as well as in the West. Miles of streets have been laid upon the sand-bed, the same being thoroughly wet and rolled until it becomes as solid as a floor. Upon this the bricks are laid without any other joints than those of clean, sharp sand, and such a pavement, with the sand foundations confined by the curbs, needs only careful maintenance, at a slight cost, to make it thoroughly durable and satisfactory. A pavement, with such a foundation, however, can only be recommended for light traffic and where the draining of the sub-grade can be depended upon. The general practice, particularly in the North and East, is to use concrete founda-

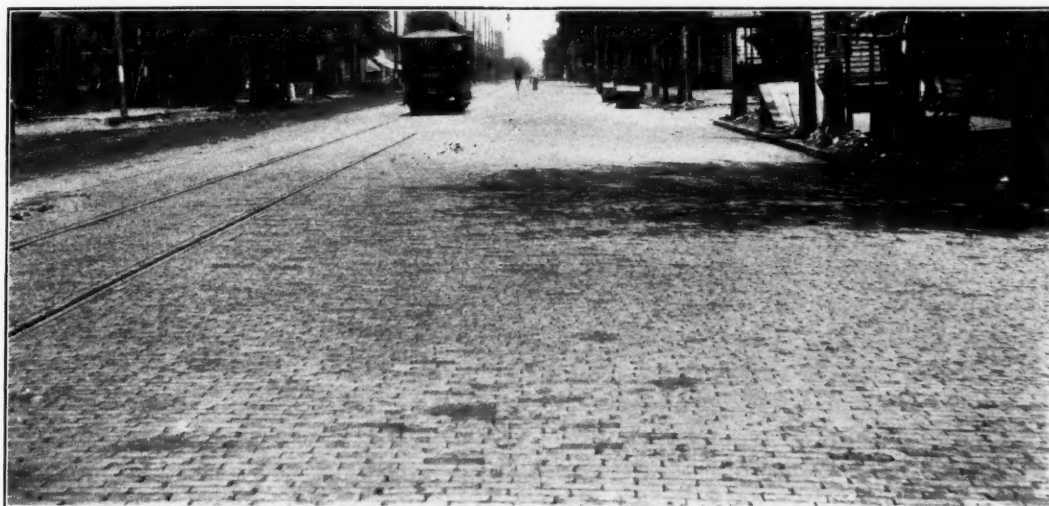


VITRIFIED CURBING†

* The above is a view of a portion of 85,000 square yards of Porter brick pavement at White Plains, N. Y., after a wear of more than five years active traffic. Manufactured by American Vitrified Sewer Pipe Co., Pittsburg, Pa.

† The above cut shows street paved with Porter block. The curb shown is vitrified curbing made in uniform lengths of two feet. Height, eighteen inches. Manufactured by the American Vitrified Sewer Pipe Co., Pittsburg, Pa.

tion, owing to the character of the soil, and the heavy traffic to be sustained. The concrete, for this purpose, is generally composed of one part hydraulic cement, two or three parts clean, sharp sand and five or six parts broken stone. The cement and sand are mixed dry and then made into mortar, after which broken stone, thoroughly wet, is mixed in. This foundation is spread evenly over the



BRICK PAVEMENT IN JACKSONVILLE *

surface and thoroughly rammed. It should be protected from the sun while drying by being moistened or covered with a layer of sand. The sand cushion and the bricks should not be placed upon it until after it has dried for a considerable time, from one to two weeks if possible, although in many cases only forty-eight hours are allowed for drying. The greatest care should be taken to insure good material and proper workmanship in constructing the foundation. If this is not well done it will produce faults in the pavement which can only be remedied at great expense.

THE SAND CUSHION

The sand cushion is a layer of sand which is generally placed on top of the concrete to form a bed for the bricks. Practice regarding the depth of this layer of sand varies considerably. In some cases it is only one and a half inches deep, varying from this up to two and a half and even three inches. A cushion of this character is not only desirable but essential, inasmuch as it not only forms a perfectly true and even surface upon which to place the brick, but it also acts as a cushion and makes the pavement less hard and rigid than would be the case were the brick set directly upon the concrete. Upon the sand cushion the bricks are laid on edge, joints being properly broken. The sand cushion, forming the bed on which the bricks are laid, is wet, smoothed and brought to the proper crown in the center of the street by means of wooden templates, properly trussed, mounted on wheel or shoes which bear on the upper surfaces of the curb. Advancing the template along the street levels and trues the sand-bed to its proper shape. The bricks are then placed on edge, broken joints being formed by placing half bricks at the curb, the bricks at the curb line being placed loosely against the curb, so that when the pavement is rolled the bricks have room to spread and

* This Jacksonville, Fla., brick pavement was laid on a typical residence street, McAvoy brick being used on a concrete foundation with a sand filler. The wearing of this pavement is said to be very satisfactory.

† This pavement was laid in Brooklyn, N. Y., in 1895-6, and has been down eight years. The photograph was taken in the winter of 1902. The brick was manufactured by the Metropolitan Brick Paving Company, Canton, O., the pavement being laid on a concrete foundation and cement grout used as a filler. There is a heavy traffic on this street, but as will be seen, it is in perfect condition.

settle into the sand-bed. This obviates the danger of forming an arch leaving a hollow space under the bricks, between the bricks and the concrete. Such a hollow space will result in the rumbling noise sometimes heard upon improperly laid brick streets. The rolling of the brick before grouting is generally done with a heavy cylinder roller, weighing about one ton to each foot of its length. Rolling should be continued until all bricks are properly imbedded in the sand cushion.

GENERAL PRACTICE AS TO KINDS OF FILLER

There is some diversity of opinion as to the best material to be used for the joints between the bricks in street paving. The three materials most commonly used are clean, sharp sand, paving cement (being a combination of asphalt, pitch and other ingredients) and Portland-cement grout, composed of the best grade of Portland cement and clean, fine, sharp sand, the finer the better. Each material has some advantages, and each must be properly used in order that satisfactory results may be obtained. A street poorly grouted with Portland cement is considerably worse than one which is not



EIGHT-YEAR-OLD BRICK PAVEMENT IN BROOKLYN †

grouted at all but which has its joints filled with clean, sharp, dry sand. It is to be particularly noted that in brick paving, aside from the quality of the bricks, the joints are the most important factor in the life of the pavement. As soon as a number of bricks in a street settle below those immediately surrounding them, because of badly made joints, the tendency of traffic over such a spot is to grind off the exposed edges of the bricks, and, in a little while, a depression in the street is formed where the bricks are broken or chipped, making it appear, to the ordinary observer, that the fault was in the bricks. The same bricks, if the joints had been good, would have worn indefinitely.



A MAIN STREET OF INDIANAPOLIS PAVED WITH BRICK *

It is obvious that in order to secure uniformity of action, the joints should be of practically the same size or width. To accomplish this end, the bricks are separated by a suitable tool, and a moderate quantity of fine sand, perfectly dry and hot, is scattered over the surface and swept into the joints before the rolling is done. The sand thus introduced into the joints keeps the bricks in place during the subsequent operations. Little attention to this matter appears

pails, the mixture being constantly stirred until it is all dipped out of the box. This method of pouring the joints secures an even and well filled joint which will add greatly to the life of the pavement. The sand and cement should be carefully mixed and should remain uniform. If coarse sand is used it separates from the cement during the operation of filling the joints and chokes up the joints with wet sand and very little cement, while other joints will be filled

would be less complaint of rumbling in hot weather.

Portland cement grout makes a very satisfactory joint when properly applied, and, by making a good support to the edges of the bricks, reduces the danger of chipping to a minimum. Too much stress cannot be laid upon the proper application of the cement grout. As usually applied, the cement is mixed with clean, very fine, sharp sand and water, and when reduced to the consistency of ordinary thin grout, is generally flooded upon the pavement from the mixing box and swept into the joints between the bricks with brooms. This method, by many engineers, is considered very undesirable. It will be found that in many cases the sand, especially where it is not as fine as it should be, gets away from the cement while the grout is being spread over the street, resulting in joints which, in some cases, are all sand, others all cement, and none properly made. A more satisfactory way is to pour the joints, the grout—thoroughly mixed—being dipped out of the mixing box with



AN OMAHA BRICK PAVEMENT †

to be given in paving work, and it is probable that if the ends of the bricks in each row were separated by evenly made joints, there

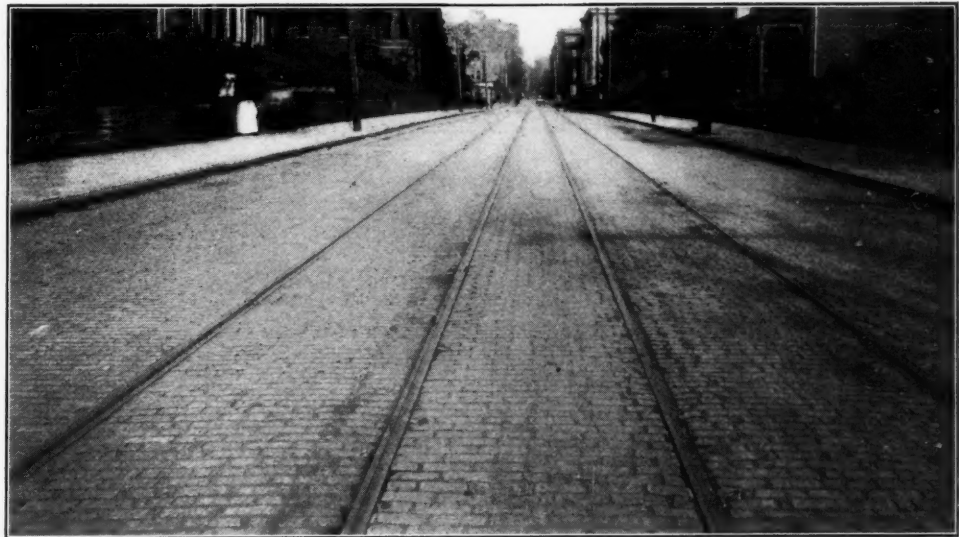
* This brick pavement was laid in Indianapolis several years ago and as to wear speaks for itself. It is a pavement made of vitrified block, known as the Veedersburg block.

† The photograph from which this cut was made was taken while the street was in the shadow, which accounts for the dark appearance, but notwithstanding this, it shows the street to good advantage. It was paved with what is known as Standard paving brick, manufactured by the Purington Paving Block Company, Galesburg, Ill., in 1892, under a ten-year guarantee given by the contractor. It is now in first-class condition, no repairs being necessary.

with cement and little or no sand. As a consequence, those joints which are choked up are not filled to the bottom, the coarse sand not having the consistency to run down between the bricks to the sand cushion. Thus no bond is forced between the bricks and they soon separate from each other under traffic, and the pavement shows great wear at these points. It is easy to see, in going over a street, where the grouting has been well done and where improperly done. Portions of the pavement, sometimes as small as one square yard, or less, with little or no cement in the joints, and showing great wear, are evidences of improper grouting.

Joints are sometimes made by mixing the sand and cement dry and heating them. The mixture is then broomed into the joints until they are filled, after which the pavement is wet down, forming the bond after the sand and cement are in place. The ordinary method, however, of pouring the grout, gives thoroughly satisfactory results when carefully done.

The paving cement joint is somewhat more expensive than that made with Portland cement. In places where the pavement is subjected to great vibration, such as in railroad streets and adjoining railroad tracks, it preserves the integrity of the pavement better. This is because the paving cement joint is elastic and allows a certain amount of play between the individual bricks, without destroying the joint between them. The usual composition, which is used at a temperature of 300° F., consists of twenty parts of refined asphalt, three parts of residuum oil, and one hundred parts of coal tar pitch, generally known at the works as No. 4. The joints should be as completely filled with this material as possible, and to effect this it must be used only when very hot. Engineers frequently insist upon the paving cement being poured into the joints from a pot having a spout; but a much better joint is obtained by pouring the material over the street from coal hods and brooming it into the joints with wire brooms. To do this successfully a heating tank on wheels is necessary, holding about ten barrels. This tank should be kept hot all day. One man is necessary to feed the fire and draw out the mixture from a spigot into coal hods. Another man carries the hods from the heating tank to a third, who pours the hot material over the street. The latter starts to pour in the centre of the street, working backward toward the curb and pouring a strip about two



ONE OF ATLANTA'S BRICK PAVEMENTS *

feet in width. A fourth man with a wire broom follows immediately after him sweeping the surplus material toward the pourer and in the direction of the curb. This method is practicable only in hot weather. When properly employed, it leaves the entire surface of the street covered with a very thin coating of the pitch. Upon this a light coating of sand is at once spread. This sand being placed on the hot pitch becomes thoroughly mixed with it, and the traffic over the street soon grinds all appearance of the pitch from the surface of the brick, leaving it smooth and clean.

* The above half-tone shows the brick pavement of Forsyth street, Atlanta, Ga. The photograph from which it was made was taken November 25, 1902, and the pavement was made with Coaldale blocks in June, 1896. What is known as the Murphy grout filler was used. The pavement between the tracks has been torn up twice since originally laid. Despite the street car and other traffic, the pavement is in good condition.

A MUNICIPAL ICE FACTORY

THE first municipality in England to establish a municipal ice factory under the approval of the local government board, is Wolverhampton. The board has authorized the Council to make ice and sell it to its customers and will allow any surplus to be purchased by other traders. Despite the many objections that were raised against this undertaking, on the ground that it was too doubtful for any municipality to assume, the officials went ahead with their plans.

The Council fortunately decided to incorporate with the ice factory cold stores, and this union of interests yields better results than if the cold stores were undertaken alone. In fact, the men interested in the work felt that to cut out the manufacture of ice from the scheme would absolutely ruin it from a financial standpoint.

The estimated demand for ice in Wolverhampton is about 1,500 tons a year and a manufactory producing seven tons a day could meet this consumption; but to provide for any possible increase in the city, a plant of ten tons output per day was installed and arrangements were made so that this could be increased to twenty tons if necessary. The cost of the buildings and insulation was estimated at \$28,500 and for the necessary machinery and appliances, \$18,750, making a total of \$47,250. It is estimated that the running expenses will be \$10,995, which includes two and one-half per cent. allowance for depreciation and sinking fund and interest on the loan. The cold stores have a capacity of 22,500 cubic feet, which if let at twenty cents per foot will produce \$4,500, and calculating on four months, 1,300 tons of ice at \$6.25 per ton, would bring in \$8,125, a total of \$12,625 and a profit of \$1,630.

The borough engineer, after considering the different methods of commercially producing cold, such as cold air, liquefaction, vacuum,

absorption and compression systems decided on the one in use. This was the one in which the cold is produced by an ammonia compression machine. The three principal methods of transmitting the cold were the direct expansion system, in which ammonia is directly expanded into a series of tubes hung from the ceiling; the brine circulation system; and the cold air current system, in which the tubes, whether dry or wet, are placed in a chamber and air is caused to flow over them. Mr. Bradley chose the last as the most preferable system.

The cold is produced by the evaporation of anhydrous ammonia in a series of wrought iron coils submerged in a rectangular tank containing brine. In the brine are the moulds in which the ice is formed. The cold brine congeals the water in the tanks and the clear ice is produced by the use of hydraulic agitation gear, by means of which the small quantity of air in the water is extracted. After the ammonia has been evaporated in the ice tank coils, the vapors are drawn back into the compressor and delivered into an ammonia condenser on the roof of the engine house, where they are liquefied.

The work of cooling in the cold rooms is produced in a similar manner, but instead of the evaporator coils being submerged in a tank they are built up in the form of a battery. This is placed in a duct which is so arranged that air is drawn in at one end by means of an electrically-driven fan, and being cooled by the coils, is distributed from the other end to the various store rooms. The advantage of this system is the entire absence of moisture on account of the cold dry air used, and a further advantage is the fact that the whole power of the plant may be concentrated in any one place if it is desired to cool such room rapidly.

CONCERNING AN IDEAL WATER SUPPLY*

Rapid Diffusion of Knowledge About the Subject—Necessity for Water Softening Apparatus—Sand Filtration Longer Used, But No Better Than Mechanical Filters

By George W. Fuller

AN ideal city water supply may be briefly described as one which provides a liberal quantity of water, under adequate pressure, for all reasonable uses of the consumers, and which, in its composition, possesses no objectionable qualities.

Such a theoretical description naturally seems trite and of little practical value to persons having to deal with this branch of public service, yet it makes a fertile theme for indicating the relation between the practical and the ideal, under various conditions actually encountered, and it is hoped that the few remarks made upon this subject will facilitate a discussion which may prove of interest and benefit.

Before considering some of the more practical aspects of public water supplies, as they have been met and solved in various communities, it will be well to elaborate, somewhat, the statement, as to what is meant by a water which possesses no objectionable qualities.

MUST BE FREE OF INFECTIOUS MATTER

First and foremost, a public water supply of such character as to approach the ideal must be free of infectious matters, such as might transmit to the people drinking it water-borne diseases, such as typhoid fever. Now that the germ theory of transmission of disease is so well and widely understood and practical proof of its soundness is available in so many instances, it is of course, unnecessary, before a meeting of sanitarians, to say anything further upon this primary requisite.

There are other qualities which the ideal water should also possess, and among the more important may be mentioned the following: It shall be palatable and free of all objectionable tastes and odors, clear and colorless, containing no mud or vegetable stain; free of noticeable amounts of dissolved iron and of iron rust; free of excessive amounts of lime and magnesia, which cause water to be hard; it shall contain of those constituents capable of corroding and dissolving metals used in the distributing pipes, only such quantities as can be handled with satisfactory results.

THE IMPORTANCE OF FREQUENT ANALYSES

Regarding means for ascertaining the character of city water supplies, the results of frequent and systematic analyses are of great importance, concerning not only the hygienic quality of the water but also its other characteristics, such as turbidity, color, taste, odors, etc. It is very gratifying to note the gradual, but rapid, increase in the amount of analytical work which is being done throughout this country in guarding the health and interests of citizens in relation to public water supplies.

Thirty years ago analyses of water were made only very rarely, and ordinarily were brought about by some unusual conditions arising in connection with large city supplies. Then the analyses embodied only the results of partial chemical tests. To-day the methods for chemical analyses and the interpretation of results are on a much sounder basis, and are supplemented by valuable microscopical and bacteriological analyses. Now it is not at all rare for large cities to have their water supplies analyzed systematically and thoroughly once or twice a week, or even daily. As to the supplies of towns and smaller cities, they are analyzed for the most part by State Boards of Health, so far as such work is done. In Massachusetts the State Board of Health is required under a law for the protection of the purity of inland waters to analyze all public water supplies, and for the past fifteen years has made such analyses usually once a month. These data in Massachusetts have undoubtedly proved of great assistance to the Board, especially in carrying out that portion of the law which requires that all plans for projected changes or additions in the water supplies and sewerage systems in the State shall have the approval of the Board before the Legislature passes the enabling act for a bond

issue. In a dozen or more states sanitary matters are now being carried on in a manner more or less resembling the Massachusetts method, although in almost every case the funds are inadequate to secure the full benefit of such a procedure, a condition which certainly ought to be remedied at once.

In those cases, where a water supply is either very good or very bad, a few analyses may do much towards showing the character of the water. But in the case of those waters, on the other hand, which might be called moderately good, or, if one chooses, slightly suspicious, due to the occasional appearance of unsatisfactory features, it goes without saying that full analytical data ought to be secured systematically and at frequent intervals.

VALUABLE INFORMATION IN TYPHOID DEATH RECORDS

When it comes to the strictly hygienic character of a water supply, much valuable information supplementary to the analytical data may be obtained from reliable records of the typhoid fever death rate in the community using the particular water in question. It is, of course, true that there are other sources of typhoid infection than the public water supply, a fact which must be clearly borne in mind in interpreting typhoid fever statistics. Nevertheless, the typhoid fever death rates are regularly low in those instances where public water supplies are unpolluted, and they are uniformly or frequently high in cases where the water supplies are regularly, or at intervals, polluted with sewage, or other objectionable matters.

In Table No. 1, there are given the typhoid fever death rates of each of the cities of the United States having a population of more than 30,000 for each of the four preceding years, together with the average rates. The table is arranged according to the rate, the first city having the highest and the last city the lowest. These records are computed from statistics collected and published under Act of Congress by the Department of Labor at Washington.

TABLE NO. 1.—TYPHOID FEVER DEATH RATES PER 100,000 INHABITANTS IN CITIES OF THE UNITED STATES OF OVER 30,000 POPULATION.

City and State.	Population in 1900.	Typhoid Fever Death Rate.				
		Aver.	1898.	1899.	1900.	1901.
Pittsburg, Pa.	321,616	113	71	110	144	125
Charleston, S. C.	55,807	110	131	109	127	74
Youngstown, Ohio	44,885	109	...	123	87	118
Allegheny, Pa.	129,896	90	58	107	93	101
Troy, N. Y.	60,651	90	73	76	155	57
Johnstown, Pa.	35,936	88	30	81	139	100
Wheeling, W. Va.	38,878	86	87	70	90	95
Knoxville, Tenn.	32,637	79	179	41	43	52
York, Pa.	33,708	72	143	71	36	38
Washington, D. C.	278,718	68	64	62	77	67
Chattanooga, Tenn.	30,154	67	72	65	63	67
Albany, N. Y.	94,151	65	99	87	51	24
Duluth, Minn.	52,969	65	52	39	94	73
Mobile, Ala.	38,469	65	62	56	68	72
Norfolk, Va.	46,624	63	68	79	45	58
Little Rock, Ark.	38,307	61	70	57	47	68
Terre Haute, Ind.	36,673	60	42	58	71	68
Galveston, Tex.	37,789	59	42	87	71	36
Louisville, Ky.	204,731	59	60	61	58	56
McKeesport, Pa.	34,227	59	48	43	67	77
San Antonio, Tex.	53,321	59	...	44	90	42
Chester, Pa.	33,988	58	49	108	35	40
Superior, Wis.	31,091	58	29	34	125	44
Atlanta, Ga.	89,872	57	15	88	61	62
Birmingham, Ala.	38,415	57	25	40	70	93
Kansas City, Kan.	51,418	57	33	...	60	79
Spokane, Wash.	36,848	55	57	48	65	48
Binghamton, N. Y.	39,647	52	72	28	53	56
Evansville, Ind.	59,007	52	49	67	63	27
New Orleans, La.	287,104	52	66	55	40	47
Lancaster, Pa.	41,459	50	66	69	41	24
Richmond, Va.	85,050	50	34	44	88	35
Philadelphia, Pa.	1,293,697	49	51	75	35	33
Reading, Pa.	78,961	49	68	34	49	43
Allentown, Pa.	35,416	48	57	64	25	47
Montgomery, Ala.	30,346	47	48	57	56	25
Wilmingon, Del.	76,508	47	37	61	47	42
Nashville, Tenn.	80,865	46	28	62	48	46
New Haven, Conn.	108,027	46	38	27	26	92
Minneapolis, Minn.	202,718	44	44	36	38	58
Dallas, Tex.	42,638	44	48	52	42	34
Topeka, Kan.	33,608	43	30	75	24	44
Hartford, Conn.	79,850	43	48	49	44	31
Quincy, Ill.	36,252	42	37	25	44	61
Portland, Me.	50,145	41	76	31	32	25
Cincinnati, O.	325,002	40	33	37	36	54
Denver, Colo.	133,859	40	32	39	42	48
Harrisburg, Pa.	50,167	40	33	41	48	38

* A paper read before the Minnesota State Sanitary Association, at St. Paul, Dec. 17, 1902, by George W. Fuller, of New York.

Los Angeles, Cal.	102,479	40	46	41	42	29
Cleveland, O.	381,768	39	34	32	54	36
Covington, Ky.	42,038	39	29	40	49	39
Elmira, N. Y.	35,672	39	49	31	48	27
South Bend, Ind.	35,999	39	27	...	44	45
Springfield, Ill.	34,159	39	43	60	29	22
Houston, Tex.	44,633	38	39	30	29	52
Springfield, O.	38,253	38	24	64	44	20
Waterbury, Conn.	45,859	38	31	34	54	31
Butte, Mont.	39,470	37	68	39	13	28
Grand Rapids, Mich.	87,565	36	34	31	42	35
Augusta, Ga.	39,441	35	21	46	35	37
Indianapolis, Ind.	169,164	35	30	39	44	27
Memphis, Tenn.	102,320	35	24	40	35	41
Kansas City, Mo.	163,752	34	26	31	36	43
Baltimore, Md.	508,957	33	38	30	27	27
Canton, O.	30,667	33	57	40	23	12
Paterson, N. J.	105,171	33	35	48	23	27
San Francisco, Cal.	342,782	33	17	52	41	20
Altoona, Pa.	38,973	32	35	34	31	28
Columbus, O.	125,560	32	28	23	42	36
Davenport, Ia.	35,254	32	9	44	43	30
Salt Lake City, Utah	55,531	32	44	21	26	35
Trenton, N. J.	73,307	32	31	46	31	19
Fort Wayne, Ind.	45,115	31	23	34	35	31
Toledo, O.	131,822	31	25	31	39	30
Wukesbarre, Pa.	51,721	31	39	30	19	35
New Bedford, Mass.	62,442	30	29	26	35	29
Seattle, Wash.	80,671	30	33	33	30	24
Boston, Mass.	560,892	29	34	30	25	25
Camden, N. J.	75,935	29	45	39	16	16
Dayton, O.	85,333	29	22	37	30	26
Akron, O.	42,728	28	18	32	36	27
Chicago, Ill.	1,698,575	28	38	26	20	...
Savannah, Ga.	54,244	28	38	36	29	10
Auburn, N. Y.	30,345	27	14	23	46	23
Buffalo, N. Y.	352,387	27	29	26	27	27
Omaha, Neb.	102,555	27	35	27	23	22
Portland, Ore.	90,426	27	24	24	36	25
Syracuse, N. Y.	108,374	27	45	19	29	15
Saginaw, Mich.	42,345	26	14	26	35	29
St. Louis, Mo.	575,238	26	17	23	29	33
Schenectady, N. Y.	31,682	26	4	...	38	35
Springfield, Mass.	62,059	26	26	25	27	25
Tacoma, Wash.	37,714	26	40	13	21	28
Erie, Pa.	52,733	25	14	35	34	15
Scranton, Pa.	102,026	25	14	25	29	30
Chelsea, Mass.	34,072	23	21	30	20	20
Lawrence, Mass.	62,559	23	19	33	22	19
Dubuque, Ia.	36,297	22	23	17	28	19
Jersey City, N. J.	206,433	22	36	15	21	16
Newark, N. J.	246,070	22	18	28	20	22
Sioux City, Ia.	33,111	22	21	9	39	20
Brockton, Mass.	40,063	21	8	18	45	14
Des Moines, Ia.	62,139	21	38	15	10	19
Fitchburg, Mass.	31,531	21	20	10	32	22
Hoboken, N. J.	59,364	21	14	31	17	23
Lincoln, Neb.	40,160	21	17	22	15	28
Oakland, Cal.	66,960	21	14	37	19	13
Pawtucket, R. I.	39,231	21	22	26	20	15
St. Paul, Minn.	163,065	21	28	19	22	14
Haverhill, Mass.	37,175	20	23	14	16	27
Holyoke, Mass.	45,712	20	18	25	20	15
Lowell, Mass.	94,960	20	26	18	18	19
Newton, Mass.	33,587	20	24	10	27	17
Salem, Mass.	35,956	20	20	20	19	11
Somerville, Mass.	61,643	20	19	25	15	19
Utica, N. Y.	56,383	20	22	18	25	16
Lynn, Mass.	68,513	19	23	19	19	14
Malden, Mass.	33,664	19	16	12	21	26
Manchester, N. H.	56,987	19	26	22	10	19
Milwaukee, Wis.	285,315	19	17	17	21	21
New York, N. Y.	3,437,202	19	20	16	21	20
St. Joseph, Mo.	102,979	19	13	36	7	19
Worcester, Mass.	118,421	19	12	16	27	23
Detroit, Mich.	275,704	18	18	20	18	16
Bayonne, N. J.	32,722	17	43	4	15	6
Elizabeth, N. J.	52,130	17	14	18	8	27
Fall River, Mass.	104,863	17	21	11	14	20
Rochester, N. Y.	162,608	17	14	19	18	18
Cambridge, Mass.	91,886	16	16	22	16	11
Bridgeport, Conn.	70,996	15	10	12	21	17
Yonkers, N. Y.	47,931	12	13	11	10	12
Rockford, Ill.	31,031	6	3	10	3	6

In examining the records in this table it is seen that there is a wide discrepancy between the average rates of those cities near the top and those near the bottom. Unquestionably the great majority of the typhoid fever deaths in those cities near the head of the list are due to the use of polluted water supplies. Proof of this is readily found in many experiences during the past ten years or so. During the period covered by the records, illustration of the effect of changing from a polluted to a pure water supply is to be found in the case of Albany, N. Y., which now has an efficient filtration plant, and also Camden, N. J., where a ground water supply was introduced a few years ago.

Regarding general views of sanitarians as to the interpretation of the character of the public water supplies from typhoid fever death rates, it is to be stated that in those instances where the public water supply of a city is pure or practically so, the annual death rates seldom exceed about twenty per hundred thousand of population living. Frequently it is much lower than this figure, but now and then the rate may be higher, due to cases of infection by milk, private wells, sea food, or by some form of secondary infection. Just where a line should be drawn separating a pure water supply from a sus-

picious one, according to the typhoid fever death rate, is, of course, a difficult matter to decide upon, owing to the influences of many varying local factors. As a general proposition, however, sanitarians are inclined to regard as more or less suspicious the public water supply of a city where the death rate regularly or usually exceeds thirty per hundred thousand, and where such rates are not largely explained by epidemics due to factors other than the water supply.

GREAT IMPROVEMENT IN THIS COUNTRY IN PAST THIRTY YEARS

Within the past thirty years it is well known that general sanitary conditions and regulations have considerably improved in this country, and are beginning, in some instances, to approach the standards which were laid down at an earlier date in Europe, and which have there proved themselves to be so beneficial. As regards public water supplies these benefits are well shown by the scores of cities having an annual typhoid fever death rate of from five to fifteen per 100,000. Comparing public water supplies with those obtained from private wells in thickly populated communities, it is true, as a general proposition, that public water supplies have lowered the death rate from water-borne diseases, and have been a benefit in many ways. With the rapidly growing population in many sections of this country, surface water supplies, which were satisfactory a generation ago, are now, in many cases, of far inferior quality to what they were formerly. Consequently, a wide movement in this country is going on with the view to securing improved water supplies.

Largely owing to the influence and teachings of sanitarians and various official sanitary organizations throughout this country, it is very gratifying to know that public opinion is slowly but surely changing, and is insisting that this branch of public service approach more and more nearly to the ideal. That progress is made so slowly in providing pure public water supplies is certainly amazing when one considers the many thousands of lives which are needlessly lost in this country each year. If a small fraction of one per cent. of the persons, who are annually killed by impure water, lose their lives in a railroad accident, the matter receives widespread attention and the public is horrified. Yet far greater losses of life due to typhoid fever may occur one by one and communities as a whole remain inactive as to remedial measures. It would seem that this state of affairs can be fully explained only by ignorance and indifference. The latter factor, as regards more highly educated citizens, is no doubt an important one, as they and their families, in many cases, are largely removed from danger by purchasing drinking water of safe quality, and other means.

It is educational work in this connection which forms one of the most important duties of the health officer. When he has thoroughly taught a majority of the citizens of a community the causes and effects of impure water, remedial measures ordinarily will not be long delayed. As to methods of teaching, there is none more forcible than that by typhoid fever statistics such as shown in Table No. 1. In Minnesota, it is understood that typhoid records are available for some years, and a computation of the death rates for all towns and cities, with statements of local conditions and causes in each instance, should prove a most valuable weapon in fighting for the cause of pure water.

OTHER ESSENTIAL CONSIDERATIONS

Taking up, in brief terms, a number of the more important practical aspects of securing what might be fairly called an ideal public water supply, it may be said, that perhaps the simplest way to accomplish this, where local conditions will permit of it, is by obtaining a ground water supply. Such water, coming from springs or from large underground streams, is of course filtered water, according to Nature's process, and is not only clear, sparkling and wholesome, free of tastes and odors, but it is also free of sewage pollution and those germs capable of transmitting such infectious diseases as typhoid fever. Unfortunately, geological conditions are not such that large cities can, as a rule, secure, near at hand, such a ground water supply. Where conditions are favorable, communities are indeed fortunate, as they secure filtered water which is stored in an underground reservoir and which is sufficiently cool for ordinary drinking purposes as taken from the ground during summer weather.

Illustrative of the improvement in the health of a community changing from a polluted river water to a ground water supply may

be mentioned the case of Lowell, Mass., where formerly, year after year, the annual typhoid fever rate ranged from eighty to one hundred and ninety-five per 100,000 inhabitants when the water supply was taken from the Merrimack River, and where the annual rate is only about twenty now that a driven well water supply has been substituted.

Although it may be possible to obtain a sufficient quantity of ground water for a community, of a quality thoroughly satisfactory, from a hygienic standpoint, it is to be borne in mind, that other complications may arise. Thus, the water may be excessively hard and unfit for use in boilers, to say nothing of the expense involved in the purchase of soap to make such water serviceable in the household. In many places in England, ground waters are softened, and without doubt the future will see numerous plants erected for this purpose in America. Winnipeg has already installed such a plant, and others will doubtless follow when it becomes generally realized that the cost of softening, on a large scale, amounts to less than the resulting saving of soap used in the household of the water consumers.

EXCESSIVE IRON MUST BE REMOVED

Another complication sometimes encountered in ground water supplies in the presence of iron dissolved in the water, in such amounts that, when exposed to the air, it oxidizes and separates out in the form of rust. Such a water, while not objectionable from the hygienic standpoint is, of course, quite unsatisfactory, as it stains and discolors linen, china, etc., and is objectionable for some of the industries. In some cases, ground water supplies have proved to be satisfactory for some years and then gradually have deteriorated in quality due to this reason, and which is frequently accounted for by the over-taxing of the capacity of the particular underground sources. In the northeastern section of this country this condition of affairs has been encountered in a number of instances, and has led already to the installation of a number of iron removal plants. In this section of the country a plant of this general character is to be found at Superior, Wis. The nature of such plants involves, first, the aeration of the water to oxidize the dissolved iron to iron rust, and then sand beds through which the water is passed at relatively high rates. In Northern Germany, the ground waters are quite generally charged with objectionable amounts of iron, and this matter has within recent years received much study there. It is understood that an iron removal plant for the treatment of ground water is being considered in connection with the enlargement of the water supply for the city of Berlin, Germany.

Still another complication in connection with ground water supplies is to be found occasionally in the presence of an excessive amount of carbonic acid or other constituents, such as give trouble through their corroding and dissolving the service pipes through which the water is conveyed to the consumers. At Lowell, Mass., a number of lead poisoning cases were attributed to excessive amounts of carbonic acid in the ground water from one group of their wells, and ultimately these particular wells were abandoned. In this connection, of course, it is to be noted, that it is possible to remove carbonic acid at moderate expense, although there are many instances where it is cheaper to secure water from wells differently located rather than to resort to either this treatment, or to replacing lead service pipes with pipes of different metal.

Notwithstanding the above complications, which have been briefly outlined as possibilities to be encountered in securing public water supplies from underground sources, such supplies, where it is practicable to obtain them, usually give very satisfactory service, and if there are unsatisfactory features it is possible to eliminate them, usually at moderate cost.

OTHER SOURCES THAN "GROUND WATER"

For a majority of cities, the geological conditions, as already stated, make it out of question to secure an adequate and satisfactory supply of ground water, and this is especially true of large cities. Under these circumstances it is of course necessary for such communities to consider ways and means for securing thoroughly satisfactory supplies from bodies of surface water. There are a number of procedures which may be taken advantage of in this connection, of which the more important are as follows:

A. Mountain streams and lakes.

B. Streams upon the watershed of which the population is scarce, and the pollution from which can be controlled by eliminating those habitations situated near the stream and feeders, and by patrolling the remaining habitations.

C. From streams upon the drainage area of which there are towns and small cities and the sewage of which is thoroughly purified by filtration before it is allowed to enter the watercourses.

D. From streams on which are built large storage reservoirs, in which the water remains for many months.

E. From streams the water of which is purified by filtration or other works of artificial construction.

On the ground that innocence is better than repentance, the absolutely unpolluted mountain stream is generally considered preferable for a public water supply to one which is obtained from somewhat polluted sources and subjected to efficient purification before it is used. In the light of our present knowledge such a position is becoming more and more a sentimental one, although, of course, it has something to support it. Unfortunately, these ideal mountain streams are rarely accessible for large cities, due to the rapidly growing population in nearly all sections of the country. Where they can be obtained, such supplies, of course, are very satisfactory, and it is to be hoped that the communities using them will see to it that the drainage areas are kept free of inhabitants.

The remaining classes of surface waters from which satisfactory public supplies may be obtained, according to various treatments, all require that the works receive careful supervision and maintenance. The kind of procedure to be adopted naturally depends, very largely, upon the existing local conditions, and a line of treatment which would be thoroughly satisfactory in one place might fail absolutely in another. In some instances, furthermore, satisfactory results might be obtained at least cost by combining several of the treatments above noted.

NECESSARY PRECAUTIONS WHERE SUPPLY COMES FROM WATER SHED

In the eastern section of this country there are numerous places where large sums of money have been spent in recent years in the elimination of that portion of the population upon a watershed so situated that there is a possibility of contaminating the stream. Combining this practice with an efficient patrolling of the watershed by persons equipped with adequate authority, there results a procedure which for small watersheds has much practical merit, and which in some instances can be put in practice at a cost considerably less than that of filtration or other purification works. In the maintenance of the older portion of the Boston water works this system of patrolling has been carried out with beneficial results, and it is a procedure which is practiced more to-day than it was ten years ago.

In some cases it is, of course, found that there are towns of considerable size upon a watershed, which it is impracticable to remove by purchase and for which a system of patrolling would have no benefit, due to the use by the town of a public water supply of its own, and the consequent production of sewage. Under these circumstances the water supply of a large community can be protected by having the sewage of the smaller town properly purified say by intermittent filtration. This process has also been resorted to in connection with the Boston water supply, where the Water Department contributed towards the establishment of sewage purification works at Framingham, Marlborough and other large towns.

Still another method for obtaining a surface water supply of satisfactory quality is the construction of very large storage reservoirs, in which the water would be stored for several months, and during which time disease germs would be destroyed. Of course this style of procedure relates to relatively small watersheds, from which comparatively large quantities of water are to be obtained, and is not applicable for large rivers. It illustrates the procedure carried out for the New York supply, and one which, perhaps, in its most highly developed form is being applied to the extensions now being made in the Metropolitan Water Works of Boston and neighboring towns, where portions of the supply will be stored for upwards of two years before reaching the consumers.

THE USE OF LARGE STORAGE RESERVOIRS

Although the several lines of treatment last considered, if prop-

erly carried out, may give a water which hygienically would be thoroughly satisfactory, it is pointed out that there is only one of them, namely, storage reservoirs of very large size, which would adequately remove turbidity and color due to vegetable stain if such were contained in the raw water to an objectionable degree. It is a fact that storage for many months will largely eliminate dissolved organic matter which produces a vegetable stain, due to the bleaching action of the sun's rays in open basins. Storage will of course also remove turbidity to a large degree.

Deterioration does not follow the storage of water for these long periods, according to present experience, in those cases where organic matter has been thoroughly removed from the bottom and sides of the reservoirs. Experience, however, in this direction has been confined largely to the fairly soft eastern waters and those of the Pacific Slope, and it is somewhat uncertain as to how the waters of the Central West, with their higher mineral contents, might behave under these conditions.

FILTRATION PLANTS RAPIDLY MULTIPLYING

Regarding purification works involving settling basins (and coagulating treatment when required) in conjunction with filtration plants, it may be said that it is possible to build and operate works which will give a satisfactory effluent for almost any water provided it is not so polluted as to be putrescible as it flows in the stream. It might be possible, even, to purify such a water if there were no limit as to cost, but that matter comes more properly under the head of sewage purification, and is not a matter for discussion at this time. In Germany, as is well known, all surface waters used as public supplies are required, by the Imperial Board of Health, to be filtered. In England this general point of view prevails in many places, as is forcibly illustrated by the works completed for the city of Liverpool some ten years ago, where water drawn from the Welsh mountains is filtered prior to conveying it to the city.

In this country the filtration of public water supplies up to ten years ago was almost a negligible factor. During the past decade, however, tremendous strides have been taken in the direction of filtered water for many cities in America. There are now in this country approximately 175 filter plants, having a daily capacity of about three hundred million gallons. Most of these filter plants are for small cities and towns, and of the larger cities there are not more than ten or a dozen which are thus equipped. That this will not be so in a few years is shown by the fact that works are being projected, or are actually being built, for the cities of Providence, New Haven, Philadelphia, Washington, Pittsburg, Cincinnati, Louisville, Indianapolis, St. Louis, Richmond, Birmingham, New Orleans and a large number of smaller cities.

As is well known, there are two general types of filters which may be used in the satisfactory treatment of surface waters in conjunction with necessary settling basins, etc., namely, sand filters and mechanical filters. In general, mechanical filters are best for the treatment of water supplies which are either very colored, due to vegetable stain, or very turbid. For waters which are fairly clear but sewage polluted, sand filters are considered best. These general statements, of course, require many exceptions, due to local conditions of various sorts. In some places extra pumping plants would be required with one type of filter and not with the other. Where the difference in cost of the two systems is quite appreciable, the cheaper one is generally the preferable. The cost of filtration, including capital charges and operating expenses, ordinarily ranges from about \$6 to \$10 per million gallons, according to local conditions. With an average consumption per

capita of one hundred gallons daily, filtration would cost from about 25 to 40 cents per capita annually.

SAND FILTERS OLDER BUT NOT BETTER THAN MECHANICAL FILTERS

Sand filters are, of course, entitled to the credit of having been used for a longer period of time, some seventy years, in Europe, and their action and efficiency are, perhaps, more generally understood. Nevertheless, well built mechanical filters, which are well operated, are able to produce as good results as sand filters. As has been already indicated, however, satisfactory operation of mechanical filters is predicated upon careful supervision, such as has not been obtained, unfortunately, in many of the smaller plants now in service, and where the cost of adequate supervision per volume of water treated would be very much greater than in plants for large cities.

Regarding the question, as to whether it is possible to obtain thoroughly satisfactory water hygienically from polluted streams by filtration, the well known experience of Lawrence, Mass., Albany, N. Y., Hamburg, Zurich, and scores of other places, leaves no room for doubt. It is of interest to note here that this matter received considerable attention from the sanitarians and statisticians of Europe at the time of the Paris Exposition, where many data were presented, showing comparative typhoid death rates in the principal cities of Germany, grouped according to the use of filtered water or ground water. These data, which were published by M. Chabal in the *Revue de Hygiene*, April, 1901, are given in Tables No. 2 and 3. They show clearly that filtered water from well built and well managed plants is as safe as ground water.

TABLE NO. 2.—AVERAGE TYPHOID FEVER DEATH RATE IN GERMAN CITIES FOR THE YEARS 1896, 1897, 1898 PER 100,000 INHABITANTS. CITIES OF OVER 100,000 POPULATION.

FILTERED SURFACE WATER.			
Stuttgart	4.	Charlottenberg	4.3
Chemnitz	4.	Nuremberg	4.6
Berlin	4.6	Hanover	5.3
Altoona	6.	Grefeld	6.3
Magdeburg	6.	Elberfeld	6.3
Hamburg	6.	Aix-la-Chapelle	7.3
Bremen	6.	Barmen	8.0
Brunswick	8.3	Leipzig	8.3
Breslau	8.6	Cologne	9.
Koenigsberg	17.6	Mannheim	9.3
Stettin	20.6	Cassel	10.3
		Flensburg	11.3
		Strasbourg	12.
		Dantzig	12.3
GROUND WATER.			
Munich	3.6	Halle	13.
Dresden	4.	Essen	13.6

TABLE NO. 3.—CITIES OF BETWEEN 40,000 AND 100,000 POPULATION.

FILTERED SURFACE WATER.			
Ratibor	3.3	Zwickau	4.7
Gustrow	3.3	Gorlitz	5.
Schwerin	4.7	Friburg	5.
Worms	5.7	Liegnitz	5.7
Kustrin	5.7	Furth	7.
Wandsbeck	6.	Kaiserslautern	8.
Tilsit	7.	Regensburg	8.
Lubeck	7.6	Coblentz	8.3
Neisse	8.	Altendorf	8.7
Stralsund	9.7	Bielefeld	8.7
Frankfort-am-Oder	10.	Harburg	8.7
Luneburg	10.3	Wiesbaden	8.7
Rostock	13.	Hildesheim	9.
Brieg	23.	Spandau	9.7
Grabow	30.	Ulm	10.
Pforzheim	74.	Wurtzburg	10.3
GROUND WATER.			
Linden	1.	Cassel	10.3
Schonberg	2.7	Ludwigshafen	11.3
Augustberg	2.7	Carlsruhe	13.
Bamberg	2.7	Duisburg	13.3
Kinshutte	2.7	Erfurt	13.7
Plauen	3.	Solingen	14.
Darmstadt	3.7	Munich	14.7
Offenbach	4.1	Hagen	14.7
Dessau	4.3	Remscheid	17.
		Halberstadt	24.3
		Metz	24.7
		Bochum	43.
		Bethuen	61.



BITUMINOUS MACADAM PAVEMENT*

Described by an Expert—Thinks It Best Pavement Ever Invented—The Asphalt Trust Hit Hard—Its Advantages Over Trinidad Sheet Asphalt

By C. A. Kenyon

THE name Bituminous Macadam was selected by Mr. Warren as descriptive of its construction. It is a stone pavement,—macadam stone, that every one understands,—mixed with bituminous cement. It combines the good qualities of macadam with the best qualities of the asphalt pavement. It eliminates the bad qualities of the asphalt as well as the bad features of macadam, and yet it is a stone pavement.

THE NECESSITY OF DECREASING THE VOIDS IN A STONE PAVEMENT

Every engineer knows that a very good pavement can be built of broken stone without any cementing material. The coarse, angular particles of stone, when submitted to heavy pressure, fit and wedge themselves together in such a way that the resultant mass has great strength and will bear great loads, practically commensurate with the strength of the stone. The mass thus laid, will have, with three inch stone, from forty to forty-five per cent. of voids. These voids, while not uniform in size, will be large, compared with the voids in one-half inch stone. In other words, there is a very large percentage of the interstices in a mass made of three inch stone, in the manner indicated that are practically uniform. I will say that practically none of the interstices one inch in diameter are incorporated in the mass described; such stones do not fill voids but have a tendency to prevent the larger sized stones from wedging together, and really increase the voids instead of decreasing them. This seems a simple truth almost axiomatic to hear it stated. When I first heard it, I thought I had always known it, but upon careful thought, I had to confess that if I had, it was so poorly and indefinitely formulated, that it had been of no value to me, and really I did not know it in any practical way. If you desire to test your own knowledge in the matter, ask yourself, what is the size, say, of 80 per cent. of the voids in a rolled mass of crushed rock that breaks with a conchoidal fracture, (for the size varies with the character of the fracture), and I think most of you will arrive at the same conclusion that I did. Yet, to know that size, and to know the percentage of stones of that size that would go in those interstices, without keeping the larger stones from wedging together, to give rigidity to the mass, is most important, and after that is known, to know the percentage of a still smaller size that will fill, under the same conditions, the smaller interstices in this second lot, and so on down, diminishing the size of the filling stones as the interstices diminish in size, until you arrive at an impalpable powder. The proper incorporation of this impalpable powder filling in a great many little places as it were, that might have been overlooked, is a most essential feature.

THE VALUABLE DISCOVERIES OF MACADAM AND TELFORD

John Macadam, in 1816, discovered the value of wedging the large stones together by heavy pressure. He also knew that this gave rigidity but not density. Water found its way down through the mass, softening the stone as well as the foundation. He also discovered that some small stones added density to the mass but this was merely haphazard, and from this day, until Mr. Frederick J. Warren worked out the rest of the problem, learning on this subject had not advanced. Mr. Telford, to be sure, in 1820, having discovered that the water seeped through John Macadam's surfaces, and wet the foundations and permitted the pavement to settle, invented what is known as the Telford base. The students of macadam pavements from his time until Warren's, have gleaned only straw and chaff. Macadam has been worked with, by nearly all the civilized nations on the globe, and thousands of miles of fine roadways are the result, but with the exception of a little more care in the selection of

the stone, a heavier roller, some faint and often abortive efforts to find a binder to exclude the water, a better system of maintenance, macadam is the same now that it was seventy-five years ago.

Through all the centuries of Greek and Roman civilization, in fact, down through English and French civilization, to the beginning of this century, no one had the creative mind to discover the way to build a good road with broken stone. How stupid! But, just as soon as people saw how simple it was, many said John Macadam claimed to have invented a new road. Any fool can do all he did.

But the decades passed, and no one improved on his method. Wood was introduced in London in the thirties; asphalt, in Paris in 1854; coal tar pitch, mixed with gravel, sand and stone screenings, in the United States in the sixties, but still, no improvement in macadam.

SOME OF THE VIRTUES AND DEFECTS OF MACADAM'S ROAD

Macadam had its virtues and while it had many defects, the virtues predominated, especially for roads through the country, where the traffic was not heavy, but in cities, the expense of maintenance has almost driven it out.

Just think again what a boon it is in place of rough stone blocks and cobbles. It is smooth, easy of traction, quiet, with an excellent footing for horses, capable of bearing great loads, and made of stone, the most durable of materials. It had, and has, its defects also, and especially for cities. Rains and water ravel and wash it badly, so that tons of the road metal go into the sewers, or are washed away by each storm. Water goes through it and softens the foundation, and it loses its grade. The fine metal on the surface mixes into a pasty mud. In dry weather, that mud becomes dust; high winds blow it off the road, and it must be replaced at great cost. The road must be sprinkled. It is costly to clean because the economical sweeping machine cannot be used; it must be cleaned by hand. It is costly to maintain. So, you see, this fine pavement had many disadvantages, as well as virtues. It needed some one to improve it, to retain its virtues and to abolish its faults.

Frederick J. Warren had been working in the manufacture of bituminous materials and asphalt pavements all his life. He is a genius with a creative mind. He set about to finish, round out and complete the work John Macadam and Telford had begun, and, I believe he has achieved the desired result in the invention of Warren's Bituminous Macadam Pavement.

THE SPLENDID ACHIEVEMENT OF MR. WARREN

He took a cubic foot of solid stone, fitted a box over it, weighed the stone, and then broke it into pieces about two inches in diameter, attempted to replace all the stone in the box, and but little more than one-half in volume, or weight, would go back into the box. He undertook the task of so breaking and arranging the sizes of that remaining out of the box, that he could place it all back into the box. The task was as difficult, as was the task of squaring a circle, inventing perpetual motion, or discovering the philosopher's stone, none of which has been or ever will be accomplished, but thousands of men with the industry of genius have worked at these problems, and many useful inventions have resulted. And so it was with this. Mr. Warren did not put all of that stone back in the box, but he did put 90 per cent. of it back, and discovered, and formulated the principle, whereby, with predetermined proportions, he can accomplish practically the same result every time.

No one had ever done it before, and if it seems easy to you, or you feel inclined to say of him as was said of John Macadam, "Why there is nothing new about that; any fool can do it," my advice is to try it. You will no doubt see the advantage of it, from a road builder's standpoint, but you will not be able to do it until some one shows you, and then, like most things genius does, it seems simple enough.

* A paper, illustrated with stereopticon views, read before the Indiana Engineers' Society, at Indianapolis, January 15, 1903, by C. A. Kenyon.

THE ASPHALT TRUST FIGHTS IT

Scarce two years had passed and its worth had been demonstrated, before those whose business it seemed likely to effect began to decry it. They said it was a "newfangled thing," "an experiment," but it kept on growing. Then it was "an old thing," had been tried years and years ago, and had proven a failure, but it kept on growing. Then, it was "a monopoly." Think of a modern "Trust" decrying an invention as a monopoly. Imagine John Rockefeller denouncing Thomas Edison as a monopolist! The agents of the Trust fulminated against it. They hired the "little" reporter to denounce it; they appealed to their political friends to ignore it; they brought suits in the courts to prevent it from being laid; but, in spite of all this, it has kept growing, and last year there was laid and contracted for, in over forty cities, from Boston to Seattle, over 640,000 square yards of Warren's Bituminous Macadam Pavement.

But, to proceed. After Mr. Warren discovered a way to reduce the voids in a mixture of stone to 10 per cent., the work was not finished. In order to accomplish a useful result, he must find a way to get that compact mass of stone, within 10 per cent. of a solid, into a pavement surface, and keep it there. He finally decided that a bituminous cement of great uniformity and durability in all temperatures; one that should be absolutely unaffected by water; one with great cementing strength, was necessary, and, with equal industry he undertook that task.

THE PAVEMENT DESCRIBED

He had had great experience in the manufacture of coal tar and asphaltic cements, having been in the business all his life, and his father before him. If he could produce such a cement to fill that remaining 10 per cent. of voids, and proper methods of manufacturing the pavement, he knew he would succeed. The result was what is known as Warren's Puritan Brands of Bituminous Cements. They are as far ahead of what had been before produced, in purity, uniformity and quality, as was his conception of making a solid. I have a sample of the mixture taken out of a pavement in Boston, Massachusetts, and sawed through in cross section with a diamond saw, which I will present for your inspection. One of the great paving experts examined it and determined it to be a perfect solid within 3 or 4 per cent. When I tell you that the most careful mixtures of sand in the asphalt pavement, show above 25 per cent. of voids, an idea may be obtained of what has been accomplished.

Of course, all of this had to be followed by the devising or inventing of appropriate bins, screens, mixers, heaters and machinery for the manufacture and laying of the pavement. All of this has been accomplished, and, as I said, over 600,000 yards of pavement laid in about two years, and \$750,000 have already been invested by various companies in the industry.

It is constructed with from four to six inches of two and one-half inches to three inch crushed, hard stone foundation, laid on a thoroughly compacted sub-grade. This foundation is thoroughly compacted by a fifteen-ton road roller and brought to a true surface. Hot bituminous cement is then poured over the surface so that it will run into the interstices, thus binding it together and making it waterproof. Many of our best engineers favor this form of foundation in preference to hydraulic cement concrete, which is pervious to water, and has not the advantage of having been wedged into place by the use of a heavy roller. The concrete foundation for any pavement, is of recent origin; the first one used in London was in 1872. On top of this foundation, is placed the wearing surface or pavement proper. The broken stone is heated in revolving drums, to about 200 degrees Fahrenheit, and then, by carefully arranged screens, separated into sizes and deposited in separate bins. From each of these bins can be drawn the exact amount of the particular size required, the aggregate of which, when brought together, typifies the result of Mr. Warren's labors, and when placed and compressed into a mass, approaches to 90 per cent. of a solid stone. This aggregate is then placed in a turning, mechanical mixer and the heated bituminous cement, by exact weight, poured in and the mixing continued until every piece of stone from the largest to the finest powder is covered with a thin waterproof coating of the bituminous cement. It is then dumped into a wagon and hauled to, and deposited in a layer or sheet, on the foundation prepared as above described, and then rolled with a fifteen-ton road roller.

WHAT THE IMPROVEMENTS ARE

The result is practically a solid. It is rigid because the large, angular stones in the mass are wedged together. These large stones thus wedged would bear the weight of any load likely to be hauled over them, without the use of any cementing material. It is therefore not necessary, as it is in the construction of an asphaltic pavement, which is sand mixed with bituminous cement, to have the cement so stiff or hard that under all atmospheric conditions the cement is strong enough to hold the grains of sand in a column. The sand without the cement, no matter how arranged, will not bear any load.

The smaller materials fill the voids in the larger materials, thus giving great density, practically the density of a solid. We have now added density to rigidity, which is improvement No. 1.

The bituminous cement makes the pavement absolutely waterproof. Warren's cements being unlike Trinidad asphaltic cement, which is affected, as most of you know, by water. This is improvement No. 2.

The bituminous cement holds the fine material in the interstices, preventing it from shifting or going to the bottom as in the ordinary macadam, and also preventing the pavement from rolling into waves, which is a common fault of the asphalt pavement. This is improvement No. 3.

The cement forms a cushion between the stones and prevents them from rubbing against one another; this makes the pavement elastic and quiet and adds improvement No. 4.

In such a dense and rigid mixture, the exposure of the cementing material is reduced to a minimum; this permits the use of a softer bituminous cement. (The softer, the more exposure it would require to render it inert, or make it lose its cementing quality.) It is believed that, therefore, the cement will retain its cementing property much longer in this form of pavement, than cements will in the asphalt or sand mixtures. By this means, the pavement lasts as long as the stone lasts, which gives great durability to the pavement. Improvement No. 5.

It, being waterproof, homogenous, and dense, rain and water cannot wash, or wind blow, any part of it away. It can be flushed with water for cleaning, or swept with a sweeping machine. This is a most important advance over macadam and improvement No. 6.

The surface is slightly indented by the laying of the stones. A flush coat of quick drying cement is poured on or squeegeed into these indentations; a sprinkle of fine sand and screenings is then spread over the surface and rolled in with the heavy roller. By this means, while the pavement has a surface for the wheels equal to asphalt, it provides a foothold for horses equal to macadam. Improvement No. 7.

This, in short, is a description of the Bituminous Macadam Pavement, and the method of its construction. It appeals to the ordinary, every day man as well as to the engineer.

WHAT IS THOUGHT OF THE PAVEMENT

A very prominent man said to me recently, that "it is so simple that the wonder is that it had not been discovered before. For twenty-five years, many very able men engaged in the asphalt paving business have been trying to improve the asphalt pavement; they seem not to have discovered this method of construction. It must be that asphaltic cement is not adapted to it." He further said, "I do not need to see that pavement laid; if you will guarantee to me that the materials are such as are described and the work well done (a thing that must be done with any construction), I am sure that a most excellent pavement will be the result. Other men may not be willing to give Mr. Warren credit for having helped the world advance, but I will."

Now, as a matter of fact, other men are giving him credit by advocating the pavement and giving it their unqualified approval. Engineers and experts from all over the country are doing this. The engineering and technical journals have endorsed it. In fact, I know of no one, except those who have business reasons for opposing its introduction, who have not praised it after investigating it. Inasmuch as the managers and agents of trusts do not waste their time in opposing things that cannot hurt them, their opposition in this case, therefore, may be looked upon as an endorsement of Warren's Bituminous Macadam.

ONE YEAR OF REFORM IN NEW YORK

More Schools—Lowest Death Rate—Cleaner Streets—The Asphalt Trust Knocked Out—Police Blackmail and Gamblers Hard Hit—Brighter Prospects for Current Year

By the Editor

WITHIN three months after the Low administration took hold of New York affairs, the local press began to find fault. This continued through the year with increasing intensity. Despite the fact that splendid work was being done in the majority of the departments, the press and the public could not overlook the supine attitude of the Mayor toward the police department. As the success of the Fusion party was made possible by the whirlwind campaign of Judge Jerome, in exposing the horrors of the blackmailing and cadet systems which had grown up under the Van Wyck administration, and as this phase of reform was handled so weakly, in comparison with what was being achieved in other directions, there was some justification for the universal censure directed at Mr. Low. The impression has gone out over the country, however, that the present administration has been a failure. We believe this to be an erroneous impression, and for that reason give considerable space to a review of the first year's work. We cannot begin to do the subject justice, for to comprehensively give a full account of the first year's work would require all the space of several issues of our magazine.

THE TAMMANYIZED GOVERNMENT WORSE THAN EXPECTED

The problem undertaken for solution by the Low administration was not thoroughly understood by even those who had given it the closest thought and investigation. The discoveries of the new administration on assuming control surpassed any conception which had previously been made. No one will ever know how many millions were lost, annually, during the four years of the Van Wyck administration by the city of New York, nor how many more millions were wrung from unwilling victims of the various blackmailing schemes put into operation by this conscienceless band of grafters.

Although the results of the election were more sweeping in their changes than any in the history of the city, and although the new Administration thereby obtained larger powers than had ever been held by any previous reform administration, it was largely handicapped in its efforts to reform the government of New York by the fact that many thousand employees of the Tammany organization became hold-overs, because of the civil service law, and, although a majority of these hold-overs were incompetents and secretly working against the Administration, the achievements have been so gratifying that a careful examination of the situation cannot fail to meet with general approbation.

This has been an honest administration and has been the means, no doubt, of saving millions to the city treasury. If there had been a gain in no other direction the supreme effort made to wrest the government from Tammany would have been worth while.

The law department, under Corporation Counsel Rives, has collected more than twice as much in arrears from the tax dodgers as during the entire four years of the preceding administration, about \$400,000 having been collected the past year as compared with \$157,316 for the four years of the Van Wyck regime. The amount collected by this bureau exceeds the salary list of the entire department for the whole year.

Penalties for violation of law and city ordinances have been collected in a sum more than double that received during the previous year. Judgments obtained against the city have aggregated over \$300,000 less than in the previous year and judgments in the city's favor, \$20,000 more.

EFFICIENT WORK IN THE DEPARTMENT OF EDUCATION

All through the Van Wyck Administration, while money was being squandered by the millions in various ways, more than 40,000 school children were clamoring for admittance to public schools already crowded beyond their capacity. The Low Administration took hold of the educational question with a vigorous hand and, as a result, twelve school houses were added, furnishing accommodations for nearly 20,000 pupils. Plans are perfected and under way whereby more than thirty-two thousand additional sittings will be provided during 1903. In addition to this, forty-three buildings and rooms have been rented in emergency cases, providing accommodations for nearly five thousand children, many of these for kindergartens. Such progress has been made, it is claimed that substantially all children over six years of age are now provided for.

For the first time in many years the records showed a total of only four thousand five hundred and three on the waiting list on September 30, 1902, and of these only four hundred and fourteen over six years of age. Vacation school work has been extended, roof concerts have been given during the summer, and for the first time school houses have been opened on Sunday for concerts and lectures.

Through the co-operation of the Comptroller, employees of the Department have received their salaries more promptly than ever before. Competitive examination has been made the sole avenue of promotion and so far as possible influence has been eliminated in the appointment of teachers.

In addition to the annual appropriation for current expenses, which amounted this year to over \$20,000,000, the largest sum ever set apart for educational purposes, the Department secured from the Board of Estimate and Apportionment a bond issue of \$6,000,000, of which approximately \$2,000,000 was for sites and \$4,000,000 for buildings.

THE PUBLIC HEALTH GREATLY IMPROVED

As a result of the efficient service of Commissioner Lederle of the Health Department, the death rate of the city has reached the lowest point ever shown. The first act of the Commissioner on assuming office was the removal of fifteen per cent. of the employees, and it is claimed that better work is secured from the remainder than the entire force had hitherto accomplished.

Contagious diseases have been effectively handled. A new scarlet fever hospital is under construction and ambulance stations and disinfecting plants have been established in two of the boroughs. More than one million people have been vaccinated during the year and smallpox, which was epidemic a year ago, has been reduced to a minimum.

The death rate from consumption has been reduced ten per cent. by the efficient methods employed. Twenty-five per cent. more milk inspection has been accomplished and convictions and fines for selling impure milk have increased two hundred per cent. A more thorough inspection of food has resulted in the condemnation of fifty per cent. more than the year previous.

The children in the public schools have been thoroughly inspected for contagious diseases, especially of the eyes, and less than two-thirds of the number of medical inspectors have performed ten times the work. The work of the inspectors has been vigorously extended to mercantile establishments and many abuses corrected. In spite of the increased labor performed, it cost nearly \$100,000 less to run the Department in 1902 than in 1901.



MAYOR LOW

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THE REORGANIZATION OF THE STREET CLEANING SERVICE

The Department of Street Cleaning under Commissioner Woodbury, has shown most satisfactory results under most trying circumstances. The Tammany grafters have resorted to the most despicable methods to hinder the Commissioner in his work, such as cutting harnesses, losing various parts of machinery and breaking others. These obstacles, in addition to the depleted and run down department which was turned over by former Commissioner Nagel, together with the fact that there were not sufficient funds to replenish and thoroughly equip the department in wagons, horses, etc., seriously limited its efficiency. Notwithstanding this state of affairs the city has been kept cleaner than since the late Col. Waring surrendered his job to Tammany five years ago. If there were an appropriation large enough to thoroughly equip the street cleaning force, the energetic management of Dr. Woodbury would soon make New York the cleanest and healthiest city in the world.

His policy of keeping those portions of the city which naturally accumulated most dirt, as on the East Side, and other thickly populated sections, thoroughly cleaned, in preference to spending so much time and money upon the less thickly populated and more fashionable parts of the city, as along the main avenue, is to be highly commended. There is no doubt but that his efforts in this direction have had much to do with lowering the death rate.

In the meantime the Commissioner has conducted a most thorough investigation of the entire department and corrected many evils by which the city was being robbed of hundreds of thousands of dollars a year. Besides all this he has thoroughly reorganized the department and increased its efficiency as compared with that of Col. Waring.

Ashes and rubbish in the borough of Brooklyn are being removed by an electric trolley system with an expected saving to the city of fifty per cent. on the whole. Much of the refuse matter formerly collected and disposed of at eighteen cents per cubic yard is now cared for without any cost to the city. A much lower rate has been secured for the removal of all waste and snow. The Commissioner desired to take over the work of street sprinkling but the Board of Aldermen very foolishly voted to continue the contract system which has proven so unsatisfactory and inefficient in the last ten years.

THE EXTENSIVE USE OF METERS ADVOCATED

In the Department of Water, Gas and Electricity much excellent work has been performed, but too short a time has elapsed to show the aggregate result. The affairs of the department were found in a wretched condition and numerous wastes in expenditures were promptly stopped on the new Administration assuming control. Plans are under way whereby the water wastage will be reduced to the minimum by the introduction of the meter system on domestic services. The system has been extended and the property of the Westchester Water Company has been acquired by legislative enactment, \$500,000 being saved on the purchase price.

In an examination of the meters already in use it was found that many of them had been so tampered with that they registered but a small portion of the water; these errors have been corrected and the receipts of the department have increased over \$800,000 in the past year, partly by arrearages which the late Administration had not

collected from favored individuals. The public parks, the people's playgrounds and breathing places, so essential to the life of a great city, were sadly neglected by the Van Wyck administration, but the year past, with an appropriation of more than \$62,000 less than in 1901, not only have all the parks maintained in former years been cared for in a manner that reflects credit upon the present administration, but, in addition, a playground, a children's garden in DeWitt Clinton Park, a temporary recreation and breathing place in Thomas Jefferson Park and two improved parks in Richmond County, have been maintained. The force has been largely reduced and the men made to work. The above are some of the improvements made in the parks of Manhattan and Richmond. Similar good work has been performed in the parks of Brooklyn and the Bronx.

The poor of the city have realized more than their portion of the benefits derived from the new Administration. Particularly has this been true in regard to the treatment of the sick. Consumptive patients have been collected from all the institutions of the city and put in a hospital by themselves where special care and extra diet have yielded remarkably favorable results. The patients and inmates of the institutions are better and more liberally fed. In the matter of bread alone a great saving has been made by the city making its own bread, which is of a far better quality than that formerly furnished by contract.

All hospitals and almshouses have been equipped with fire escapes, extinguishers and other apparatus; all buildings have been repaired, or extended, so far as funds have permitted. The eight hundred children of the Randall's Island institute now have the services of a dentist, where formerly they had none.

The Dock Department furnishes more than its quota of corruption. After a fair hearing at a public

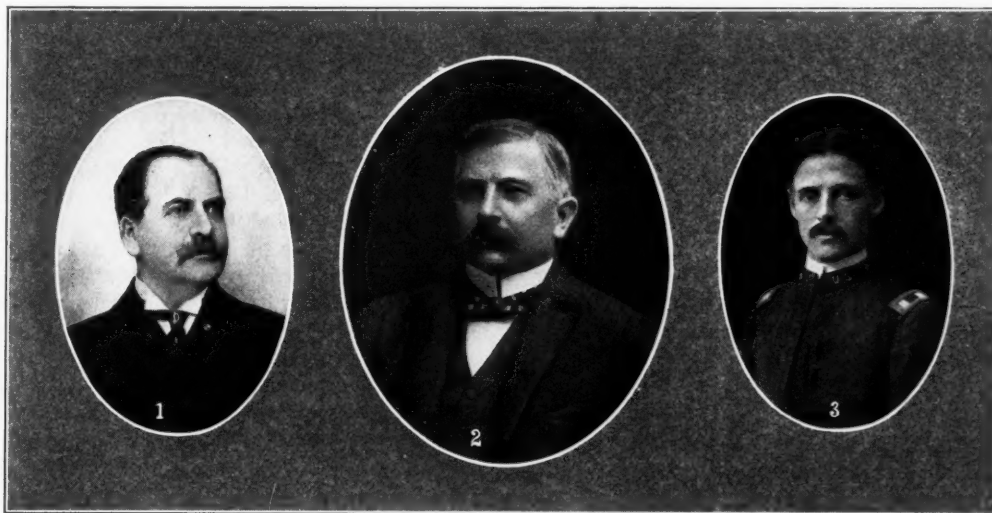
trial upon charges preferred, one-quarter of the number of former dock masters have been dismissed, and without an increase in rates the dock masters collections have increased fifteen per cent. over 1901. Nine new piers have been commenced and two recreation piers, one in Manhattan and one in Brooklyn, have been located, one of which is under construction. New ferries have been established between the Boroughs.

Dumps have been allotted to the highest bidders instead of being leased to favored parties, as formerly, which has greatly increased the revenue. For instance, the dump at the foot of Thirtieth street leased last year for \$1,730; this year, \$6,700; that at the foot of West Forty-third street leased last year for \$1,800, this year, \$5,700.

THE WORK OF THE BOROUGH PRESIDENTS

The Borough Presidents have obtained most satisfactory results in their several fields of labor. In the Borough of Manhattan President Cantor has broken up the asphalt ring and obtained asphalt pavement at less than half the price paid by the former Administration and at an estimated saving to the city for 1902 of \$400,000. He has contracted for three fine public baths, open all the year round, in the most thickly settled quarters of the city. His Bureau of Sewers, in the first seven months of the year, cleaned more than twice the mileage that was cleaned during the year 1901.

Numerous matters of minor detail, such as street signs, isles of safety for congested streets, etc., have been among the improve-



POLICE COMMISSIONERS OF NEW YORK

1. Major F. H. E. Ebstein, 1st Deputy Commissioner. 2. General Francis V. Greene, Commissioner (copyright, Gessford, 1900). 3. Captain Alexander R. Piper, 2nd Deputy Commissioner

ments made on Manhattan under the direction of President Cantor.

President Swanstrom of the Borough of Brooklyn, has performed equally efficient service. Under his direction the Department of Public Works has aided in destroying the asphalt monopoly, reducing the average price of sheet asphalt from \$2.83 per square yard, including concrete base, and five-year guarantee, to \$1.79 per square yard, and with positive improvement in the quality of the work done.

More contracts for necessary re-paving were given out in 1902 than for the entire four years of the previous Administration, and this was accomplished at an expense of \$1,400,000 as compared with \$1,580,000. Nearly fifty miles of pavement were laid last year at the unprecedented rate of 2,000 square yards daily. Repair squadrons were operated so expeditiously that the complaints of one day were remedied the next.

GREAT IMPROVEMENT IN THE FINANCES

The Comptroller's Department was never so efficiently handled as under Mr. Grout. Many reforms have been instituted at great profit to the city and the work most thoroughly systematized.

The city's debt is as follows:

December 31, 1902, gross funded debt.....	\$438,503,423.27	
December 31, 1901, gross funded debt.....	416,262,223.61	
Gross increase	\$22,241,199.66	
1901. 1902.		
Gross funded debt.....	\$416,262,223.61	\$438,503,423.27
Less special revenue bonds to be paid the year following	4,322,997.69	4,272,308.41
Gross permanent funded debt.....	\$411,939,225.92	\$434,231,114.86
Less all sinking funds, including both investments and cash.....	126,340,920.47	138,348,986.30
Net permanent funded debt.....	\$285,598,305.45	\$295,882,128.56
Increase for the year 1902.....		\$10,283,823.11
There have been issued since consolidation without regard to revenue bonds issued in anticipation of taxes:		
Bonds to the amount of.....	\$176,175,211.30	
Deduct special revenue bonds.....	25,333,618.98	
Gross increase of permanent debt.....	\$150,841,592.32	
Deduct bonds issued to refund loans matured.....	2,583,800.73	
Net increase in permanent debt.....	\$148,257,791.59	

The net permanent funded debt has increased during the period (since consolidation) only \$70,000,000, as appears below:

Net permanent funded debt, December 31, 1902.....	\$295,882,128.56
Net permanent funded debt, December 31, 1897.....	225,688,025.53
	\$70,194,103.03

* This includes \$3,488,321.54 of assessment bonds, which should be paid, ultimately, from assessments for local improvements.

The growth of the sinking funds in 1901 was \$7,000,000; in 1902, \$12,000,000. The increase of gross debt in 1901 was \$20,000,000; in 1902, \$10,000,000.

THE FAILURE IN THE POLICE DEPARTMENT

The failure of former Commissioner Partridge, whom Mr. Devery very aptly describes as "a nice old man," to successfully cope with the problem of reorganizing the police department, subjected Mayor Low to the fiercest kind of criticism for reasons before mentioned. Although the Commissioner, during the twelve months of his service removed a total of sixty-seven men, including two captains, as compared with the removal of thirty-one for the previous four years, he failed to reach the root of the evil in the department, and as a consequence the old system of blackmail and criminal protection continued. Commissioner Greene, his successor, actually did more to uproot "the system" in the first twelve days of his incumbency than Commissioner Partridge had done in the previous twelve months. The new Commissioner has taken firm hold of the department and given it a shake such as it never experienced before, not even in the days of the Lexow Committee, and he has already demonstrated that he is master of the situation.

Mayor Low was also unfortunate in his choice of Fire Commissioner, as that department is one where the least improvement has been made. Contrary to the wishes of the vast majority of New York's citizens, apparently for political reasons, the Commissioner trumped up charges against Chief Croker, sat as his judge, and of course found him guilty and removed him. The only redeeming feature about the whole proceeding is found in the fact that the Commissioner had the good sense to appoint a man of thorough training to take the place of Mr. Croker. Acting Chief Purroy has

served many years in the department and brings to his new position not only a rich and profitable experience but the good will and wishes of a majority of the force.

The appointment of a Municipal Explosives Commission by the Mayor shortly after the first explosion in the subway a year ago, was a sensible and proper step to take, but a grave error was committed in the selection of some of its members. For instance, two of them hold positions in companies which manufacture certain kinds of dangerous explosives, and, as a consequence, would not be unbiased officials for the city in formulating rules and regulations to govern the use of dangerous explosives and those which are known as "safety" explosives. A set of rules and regulations has been formulated by the Commission, but not yet enacted, the provisions of which practically prohibit the use of the so-called "safety" explosives. It is indirectly, but effectively accomplished in this way. Explosives are divided into two classes; pure nitro-glycerine, and nitro-glycerine compounds. The use of the former is absolutely prohibited within the city limits, but nitro-glycerine compounds are permissible under certain restrictions, such as the amount of the charge to be used, storage, transportation, etc. All of these are proper as far as they go but they do not go far enough. The rules do not include a unit by which any explosive other than nitro-glycerine compounds can be measured. For example, Article VII, Part II, Subdivision 6, of the proposed regulations reads: "The quantity of explosives to be used shall not exceed the equivalent in disrupting force contained in one pound in weight of 50 per cent. dynamite for each four feet depth of a hole that is above or less than ten feet below the curb." As the Commission does not give the composition of materials that make up the 50 per cent. balance contained in the one pound of dynamite, nor name a method for determining the said disrupting force, it is impossible for the manufacturers of certain so-called safety explosives made of material which do not contain a particle of nitro-glycerine, to determine the quantity of their explosive that may be used and at the same time comply with the above rule. Consequently the use of any other than dangerous explosives is practically prohibited. If there is anything less dangerous, not to say safe, than nitro-glycerine compounds, then it is not only the Commissioners' duty to open the way for but to insist upon the use of the so-called "safety" explosive.

The "safety" explosives are so named because it is absolutely impossible to make them explode, except by the use of a strong percussion cap. It has been demonstrated by repeated experiments that these "safety" explosives are not affected by heat, cold, hammering, or anything else except the one mechanical action applied by the operator. A ton of this form of explosive could be put in a burning building with perfect safety.

The Commission has handled this subject so unintelligently that it has produced no unit by which all explosives can be measured. The characteristics of the "dangerous" and the "safety" explosives are so radically different that the same rules and regulations, especially as to their storage and transportation, should not be made to apply to each.

An engineer of some note claims that seventy-five per cent. of the premature explosions are due to the process of thawing out dynamite sticks, and that all the great explosions recently occurring in New York have arisen from this cause. The investigation a year ago showed that the first terrible explosion was thus caused. This being the case, the use of a "safety" explosive would reduce the danger seventy-five per cent., as the so-called "safety" explosives are unaffected by either heat or cold. Either a new Commission should be appointed, or the present one should establish scientific and intelligent rules and regulations respecting the use of explosives.

It is impossible, in this brief summary, to do justice to so great a subject,—the achievements of the first year of New York's reform administration. Reforms have been effected in the tenement house districts, the Department of Bridges, the Civil Service Commission, and others, and the comfort, convenience and rights of the people have been looked after as never before, and if the government of the metropolis is again turned over to the Tammany grafters at the end of this year, the citizens of Greater New York will have occasion to remember with keen regret the clean, energetic, honest administration of Mayor Low.

THE CONFERENCE ON GOOD ROADS

The Most Important Gathering on Good Roads Ever Held—Many Congressmen, Other Officials and Notable Good Roads Advocates Will Be Present

By the Secretary

THE International Conference on Good Roads, which has been called in connection with the annual meeting of the American Road Makers, at Detroit, February 13th and 14th, bids fair to be the most important gathering dealing with this subject ever held. Every Governor has been invited and requested to appoint ten delegates, and similar invitations have been sent to Mexican and Canadian authorities. Thus far, nearly one hundred have been appointed to represent different states and by the Tenth of next month it is expected to have a list of delegates which will represent every state in the Union.

Owing to the pressure of public business, it was not expected that many Congressmen and Senators would be able to attend this meeting, but nearly a score have accepted the invitation, and nearly all have expressed a most lively interest in the questions to be discussed, particularly the plans for the appointment of a National Commission to consider the project for inter-capital-connecting highways.

Many expressions favoring the movement have been received. Senator Burnham, of New Hampshire, writes, "The people of my State are very much interested in the subject of good roads and I shall always favor such measures as will reasonably and properly promote the building of good highways."

In accepting the invitation Congressman-Elect Franklin E. Brooks, of Colorado Springs, Col., remarks, "I am heartily in sympathy with the general purpose and plan of the organization and shall be glad to further its designs."

Congressman Townsend Scudder, of New York, writes, "My interest in good roads is very keen. In my own small locality I worked zealously, and successfully I am pleased to say, to inaugurate and put through a great county road system in Queens county, which I believe to be the finest system of macadam work in New York. A similar work I should like to see inaugurated throughout the country, and the first step unquestionably will be the building of great arteries between capitals or the principal cities of the several states. Anything that I can do to co-operate with you I will do gladly."

Charles S. Weisse, Congressman 6th District, Wisconsin, said in his reply, "I will attend if possible. I am in favor of this move and good roads is the best paying investment any district can make."

Congressman-Elect Norton P. Otis, of New York, writes, "I do not think I shall be able to attend the International Conference in February, yet I beg to assure you that I am heartily in sympathy with any movement for bettering the condition of the highways. This is a matter in which our country is a good deal behind many of the European countries as yet, and I trust that means will be discovered to give us as good roads as are to be found anywhere in the world—perhaps we are entitled to better ones."

Congressman John A. Keliher, of Boston, writes, "I beg to assure you of my entire sympathy with the object of this movement and that my endeavors while in Congress will be directed toward putting into practical operation that for which you are now striving."

"I am heartily in favor of anything which will further the construction and maintenance of good roads in the United States," remarks Congressman-Elect William H. Wiley, of New Jersey, in responding to the invitation. "This appeals to me not only as a citizen but also as an engineer in which profession I have spent many years of my life and am more or less familiar with road construction. There is no reason why we should not have them, unless it is because of the indifference of people in general to a matter of public interest of this kind."

"The farmers, of all men throughout the West, should be foremost in the promotion of any plan of this kind. The contrast of the condition of many of our Western roads with those in other countries is so great that it seems they should not have been neglected even as long as they have. I should be most pleased to co-operate in any way

in the matter, but other engagements will prevent my attendance. You may feel sure that any measures of this kind which come before the Fifty-eighth Congress will receive most careful consideration at my hands. I wish you success in this movement for the benefit of the country at large."

Congressman John Dougherty, of Missouri, says, "I am very much in favor of the improvement of the roads of our country and believe that it is one of the great practical questions of the day. The development of the railroads and traction roads of all kinds has far exceeded the development of the ordinary roads, which are necessarily the feeders for all other kinds of roads, and it is high time that the ordinary roads were receiving the attention they deserve."

Congressman-Elect Wyatt Aiken, of South Carolina, says, "I am heartily in favor of improving the public roads in the Republic and will do all in my power toward having such legislation enacted to help build them up. I believe the general government, state and counties, should jointly improve, permanently, all roads where mail is now delivered free under the free rural delivery system. It will take time to do this, but in ten years' time a marvellous amount of permanent improvement could be made."

Congressman A. G. Foster, of Tacoma, Washington, says, "I wish you and the other road makers to know that I am in hearty sympathy with the general movement and the general plans and scope of the good roads associations throughout the country."

The programme has not yet been completed, but it will be sufficient to say that the two leading questions to be brought before the Conference will be most intelligently and thoroughly discussed. Congressman Brownlow, the author of the Bill now before Congress providing for an appropriation of \$20,000,000 for the use of the Department of Road Inquiries in a general scheme for national highways, has been invited to open the discussions favoring his project. State Senator Earle, of Michigan, will undoubtedly present the claims of the inter-capital-connecting highway plan. Governor Bliss, accompanied by both Houses of the State Legislature of Michigan, will be present and take his part in the general discussion.

Delegates and others attending this Conference will be entitled to the special rates granted to such gatherings by the Trunk Line Association. In order to use this privilege it will be necessary for the delegates to ask for a special certificate provided for this meeting, at the local station where they expect to buy tickets. In order to be on the safe side, it would be well to ask the local agent for such a certificate several days in advance so that in case of any neglect on the part of the Trunk Line Association to supply him with the necessary blanks, he can have time to secure them. Delegates will be expected to pay full fare one way, and the certificate referred to is practically a voucher that such fare has been paid. At the Conference, this voucher will be signed by the Secretary of the meeting and countersigned by a railway official, who will be present on the second day of the gathering to care for all such certificates. After it has been duly signed the holder can purchase his return ticket, via the route he came, for one-third of the regular fare.

The headquarters of the convention will be at the Wayne Hotel, which is centrally located and sufficiently commodious to accommodate visiting delegates. The usual rates will be charged, and those intending to be present would act wisely to engage their rooms in advance. There are other good hotels, the Cadillac and Russell Houses, which will take care of any overflow attendance.

Delegates should register immediately upon arrival at headquarters, receive their badges and copies of the printed programme. Further particulars may be learned by addressing the Secretary of the American Road Makers, Postal Telegraph Building, New York City, or the President, Hon. H. S. Earle, State Senator, Detroit, Mich,



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NEW YORK, FEBRUARY, 1903

National Municipal Ownership Convention

A NATIONAL Convention on Municipal Ownership and Public Franchises has been called by the New York Reform Club to meet in the rooms of the Club, 233 Fifth avenue, New York, on February 25, 26 and 27.

A preliminary notice of the programme arranged for includes the following addresses: "Recent British Experience of Municipal Ownership," by Mr. Robert Donald, Editor of *The Municipal Journal*, London; "Recent German Experience of Municipal Ownership," by Mr. Edward T. Heyn, of Berlin; "Comparison of European and American Methods and Results," by the Hon. Robert P. Porter, Director of the Eleventh Census of the United States.

The question of "Transportation" will be discussed by Mr. Charles T. Yerkes, of London and New York; Hon. Carter H. Harrison, Mayor of Chicago; Mr. Edward M. Shepard, Counsel to the Rapid Transit Commission of New York, and Mr. Louis D. Brandeis, of Boston.

"Gas and Electric Lighting" will be discussed by Lieutenant J. B. Cahoon, Secretary of the National Electric Light Association; Mr. Walton Clark, General Superintendent of the Gas Improvement Company, Philadelphia, Pa.; Mr. Alton D. Adams, Engineer, Boston, Mass., and Prof. Edward W. Bemis, Water Commissioner, Cleveland, O.

The subject of "Public Water Supplies and Public Telephones" is covered by the following topics: "European Experience of Public Ownership of Telephones," by Mr. Bennett, Engineer for Glasgow and other British Municipal Telephone Systems; "Argument for Public Ownership of Telephones," by Prof. Frank W. Parsons, of the Boston Law School; "The Superiority of Corporation Ownership of Telephones," by Mr. U. N. Bethell, General Superintendent of the New York Telephone Company; "City Ownership of Water Supply," by Mr. William R. Hill, Chief Engineer of the Aqueduct Commission of New York.

Other topics are announced as follows: "How Should Public Service Corporations be Controlled?" by Mr. R. R. Bowker, formerly of the Edison Electric Illuminating Company of New York; "Regulation and Taxation of Public Service Corporations," by Mr. Allen Ripley Foote, Editor of *Public Policy*, Chicago,—the discussion on the latter topic to be opened by Prof. John R. Commons, Secretary of Taxation Committee of the National Civic Federation; "Labor

Clauses in Franchise Grants and the Labor View of Municipal Ownership," by Ex-Mayor Chase, of Haverhill, Mass.; "Taxation of Franchise Values," by Mr. Frederick Howe, of Cleveland, O. The discussion on the latter question will be opened by Mr. Wheeler H. Peckham, President of the City Club, New York.

The Reform Club will be the headquarters for the Convention and the privileges of the Club will be extended to all delegates. An informal dinner will be given by the Club to the guests from out of town, on Friday evening, 27th.

It is expected that railway companies will grant the usual rate of a fare and one-third for the round trip, if one hundred or more attend the convention from out of town, but in order for delegates to avail themselves of this privilege it will be necessary for them to secure a special certificate, provided for this convention, from the local station agents from whom they purchase their tickets.

A stenographic report of the proceedings will be taken for publication in *Municipal Affairs*, which is the quarterly published by the Reform Club Committee on City Affairs.

The MUNICIPAL JOURNAL AND ENGINEER will give a brief account of the proceedings of this convention, which will undoubtedly be the most notable meeting of its kind for the year. It is only regretted that lack of space will prevent the publication of all the papers, addresses and discussions.

Street Railway Traffic in New York

THE agitation for better street railway facilities, the reduction of the overcrowding of the cars, has reached what may be called the strenuous stage. Various women's organizations of Greater New York have been at the subject for many months, and have finally succeeded in arousing several of the more powerful trade organizations, such as the Manufacturers' Association of Brooklyn, and the Merchants' Association of Manhattan. All sorts of demands have been made; some reasonable and some unreasonable. What we consider reasonable demands which might be made upon the transportation and civic authorities have been set forth by the Merchants' Association of Manhattan, as follows:

1. "Full and continuous service on all lines by the running of all cars necessary for the speedy movement and proper accommodation of the public so far as physical conditions permit.
2. "The removal of unused car tracks in Greater New York provided the city will safeguard the present franchise rights to the future use of those streets from which said tracks are removed.
3. "The equipping of all cars with vestibules to protect the motor-man and conductor.
4. "The provision of two conductors for every car during the rush hours and on all the long cars at all times.
5. "The extension of the transfer system, particularly at junction points.
6. "The promotion of proper police regulations covering the trucking and traffic on the streets through which lines are operated.
7. "The removal of obstructions of all kinds, including snow, from the public portions of streets on which car lines run.
8. "The enforcement of the public ordinances respecting ventilation and cleanliness."

In addition we would suggest that the city demand that the transportation companies reduce the fare to three cents so long as the over crowded condition continues. This would touch the treasury of the company, and as has often been demonstrated before, is the only effective way of bringing corporations to time. It will be many years before the transportation facilities of New York will be sufficient to give every passenger a seat at the rush hours, but there is no doubt that the over crowded condition of the cars can be relieved to a certain extent provided sufficient force is brought to bear upon the transportation managers. Street railway companies are never generous to the public and never yield even to reasonable demands except by compulsion. It is to be hoped that the combined effort of the various organizations, the civic authorities and the public will be successful in mitigating, at least in some small degree, the New York situation.

New York's Franchise Tax Law Invalidated

THE Appellate Division of the Supreme Court of the State of New York has decided, by a vote of three to two, that the provision of the Ford Franchise Tax Law, whereby the power of assessment is taken from local officers and imposed upon the State Board of Tax Commissioners is unconstitutional, in that it violates the principle of home rule as expressed in the constitution.

The prevailing opinion admits that the Legislature has power to include franchises in the list of taxable property, but insists that property so added must be assessed by local officers. Had the Ford bill passed the Legislature of 1899, in its original form, there is little doubt that its constitutionality would have been sustained by the courts.

The original bill provided merely that franchises, or rights, to use streets, highways and public places should be included in the assessments of real estate for purposes of taxation, leaving the valuations to be made by the local officers elected, or appointed, to perform such duties. When the corporations affected by the law induced Governor Roosevelt to call a special session of the Legislature to amend the bill in their interest, they represented to him that it would be unjust to expose them to local prejudice and local ignorance respecting the value of such franchises. They said that it would be much fairer to have these particular assessments made by State officers of high intelligence and impartiality. The Governor made a mistake when he yielded to their importunities, for as soon as they got their amendments adopted they contested the law itself in the courts on the ground that local assessments by State officers would be unconstitutional.

The clause of the State Constitution on which they relied is article X., and section 2, which provides that "all city, town, and village officers whose election or appointment is not provided for by this Constitution, shall be elected by the electors of such cities, towns and villages, or of some division thereof, or appointed by such authorities thereof as the Legislature thereof shall designate for that purpose." The Franchise Tax Law provides that "the State Board of Tax Commissioners shall annually fix and determine the valuation of each special franchise subject to assessment in each city, town, village, or tax district." It is this clause which the Appellate Division, by a majority of one vote, holds to be unconstitutional.

There is some doubt as to whether this invalidates only this portion of the Franchise Tax Law or whether it affects the law as a whole, but the consensus of opinion confirms the view of Comptroller Grout, of New York, who holds that this decision only affects the manner of the assessment and not the law creating the tax. Should the Court of Appeals sustain the decision, the power for fixing the valuation of franchise properties would be transferred from the State to the local authorities, and the corporations who have been so strenuous in their efforts to avoid the payment of their just dues may find that they have only jumped from the frying pan into the fire. They may, on one pretext or another, defer the payment of their share of the taxes of city and state, but ultimately they will reach the end of their rope and they will have to come down with the cash, for justice is sure to win in the long run.

EDITORIAL COMMENT

By the extensive use of water meters the Water Works Department of Minneapolis, has reduced its per capita consumption eighty-five gallons. There are about eight thousand water meters in use, which cover about one-third of all the taps. More than fifteen hundred meters were set last year. The introduction of meters in connection with any water system is bound to curtail waste.

The next annual meeting of the League of Ohio Municipalities was to have been held at Hamilton, but the committee on arrangements of that city has found that it would be unable to take care of the convention and has notified the Executive Committee of this fact. For this reason the place of meeting has been changed from Hamilton to Dayton, where the next annual meeting of the League will be held on the dates given before, February 10, 11 and 12.

The city of Nashville, Tenn., thanks to its energetic mayor, for the past two years has received five per cent. of the gross earnings of the gas company, and the city has received about \$28,000 as its share. Mayor Head accepted office with a well defined policy to make all public service corporations pay their full share of tax burdens and pay something for the privilege received. It would be profitable for municipalities if other mayors were to follow his example.

With characteristic progressiveness, the authorities of San Francisco have introduced an ordinance in the Board of Supervisors prescribing the qualifications of all elevator operators, also for the care, and inspection of elevators, so as to insure greater safety to the public. They should go one step further and add a paragraph to the ordinance requiring all elevators to be equipped with some efficient safety device, so that in case an elevator falls it will not mean death, or serious injury to the occupants of the car.

The city of St. Paul has finally succeeded in breaking the prices of the asphalt trust and is getting a material reduction in the charge for sheet asphalt pavement. On one contract the successful bid was at \$1.75 per square yard; on another \$1.85. We are still of the opinion that it is not good business for a city to beat down the price of asphalt below \$2.00. A first-class, durable sheet asphalt pavement, with a five-year guarantee, cannot be constructed for less money, if the specifications are what they should be.

The city employees of Pittsburgh are making a sensible strike for a municipal library and proper facilities for consulting municipal records. The importance of a library in which to preserve the records of any municipality cannot well be over estimated. Unless there is some such provision made for the care of the city records they are liable to be lost. More than this, fire-proof files should be provided in all instances for the preservation of valuable records. This is the proper season of the year to bring the matter before the City Council.

'Leaking gas mains are the cause of a great deal of damage to city and private property as well as public health. The escaping gas often finds its way into cellars and houses, sometimes causing explosions with attendant damage and loss of life, and often is a direct cause of illness. It is well known that asphalt pavements are damaged to the extent of thousands of dollars annually by leaking gas mains. And it has long been a notorious fact that one of the greatest hindrances to the cultivation of trees and shrubs along the streets has been the leaking gas. We believe that the mayors and boards of aldermen of the various cities, where gas companies exist, should enact ordinances compelling the companies to remedy this evil. It is far greater than it should be.

The police situation in New York has greatly improved since the retirement of Col. Partridge and the appointment of Gen. F. V. Greene. When appointed, everyone thought that Col. Partridge would make an ideal commissioner, but, instead, he proved a lamentable failure. He failed to apprehend the seat of trouble, and, therefore, could not aim a telling blow at the nefarious blackmailing system fostered by the Van Wyck administration. He should have retired at least six months before he did. Happily for the Fusion administration, his successor, Gen. Greene, has already accomplished more toward the uprooting of "the system" and the correction of the evils in the department in the short time he has been in office than his predecessor achieved in the preceding twelve months. It is to be sincerely hoped that he will be able to keep the pace he has set for himself, and if he does, by the end of the year we will have a spotless police department if not a "spotless town."

Awarding contracts to the lowest bidder is not what it is cracked up to be. It reduces the price of pavements, for other construction work, and for supplies to the lowest possible figures, but it also reduces the quality to the lowest possible notch which will pass inspection. The wage earner must have a living wage and likewise the contractor must have a living profit. If a municipality cuts the price below the

fair and reasonable point the contractor is sure to make his loss good in some other way, regardless of the specifications. As we have remarked before, this is not only a poor but a vicious policy. The city engineer and other purchasing heads of departments, are paid because of their peculiar qualification and fitness to administer their affairs, and for that reason the responsibility should be placed on their shoulders and they held to strict account for results obtained, the same as would be done in any large business concern were they at the head of similar departments. This is a matter which should have the close attention not only of mayors, but aldermen, within whose power it lies to correct the bad practice.

The United States Supreme Court has recently handed down an important decision which will be of interest to every municipality in the country, as it upholds the tax levied by the borough of New Hope, Penn., on the poles of the Western Union Telegraph Company. The telegraph companies doing business in this country pay little or nothing for privileges extended to them by various municipalities. So long as telephones, electric light, water works, and street car companies are obliged to pay tribute to municipalities in one way or another, we see no reason why the great telegraph company monopolies should be exempt. It is true that in a few cities they are made to pay a small license fee for each pole erected within the city limits, but this practice is by no means general, although it should be. So long as these and other companies using poles within the city limits pay nothing on their gross receipts, nor in any other way reimburse the municipality for privileges granted, we believe it only just for the city authorities to levy a tax of this sort. When the full possibilities of this decision are realized perhaps the franchise corporations will deem it wiser to accept a tax based upon gross receipts than to incur the arbitrary assessments that might be made.

A sensible fight is being made in Salt Lake City for cleaner street cars. At the instance of Health Commissioner King, City Attorney Nye has drafted an ordinance which seeks to compel the street car company to keep its cars clean. Street cars are properly fumigated and cleansed in other cities and there is no reason why it should not be done in Salt Lake City. This particular ordinance provides that no car shall be operated that has not been thoroughly cleaned within eighteen hours. That means that each car, after being taken to the barns at the close of the day's service, must be thoroughly cleansed before it goes out again. A continuance of the bad practice of allowing conductors to sweep out cars during the day while they are in use, is also prohibited. A provision is also made for the posting of a card calling attention to the ordinance prohibiting expectoration in cars. For any infraction of the law a fine, ranging from twenty-five dollars to one hundred dollars, will be imposed. We would suggest that another clause be added to this ordinance making it obligatory on the part of the conductor to enforce the health ordinance prohibiting expectoration on the car floor, as is done in Washington, where this restrictive measure is carried out more efficiently than in any other city in the country.

The new steel road, recently laid in Murray street, Manhattan, under the direction of Gen. Roy Stone, is a dismal failure so far as its application to this particular street is concerned. This is one of the busiest streets in the downtown district. For the greater part of the day the track is impeded by the trucks backed up to the curb on either side to permit the loading and unloading of goods, so that the steel track laid through the center of the street is seldom free enough to permit a truckman, even if he so desired, to use the track. Moreover, during the few times that the street is clear, only about one truckman in ten attempts to use it. As might be expected, those who do use it find the traction easier. When the official test of the traction was made a few days ago it was found that it took thirty-seven and one-half per cent. less of power to draw a given load when using the rails. But even if this kind of roadway were laid in a more suitable street, like Park Place, it would not be available for anything except single truck traffic, for, with a double team, one

horse is sure to track along the steel railway and thus not have an equal footing with his mate. This feature has proved very objectionable when double teams have used the steel track in Murray street, as they do once in a while. It is to be hoped that the engineering department of New York will see to it that no more of this track is laid, for it really forms an obstruction to the street; and it would be the height of folly to attempt to use it or adapt it to the country road. It appears to be another scheme to create a larger market for steel.

LETTERS TO THE EDITOR

Not as Much Money as Reported

NEWARK, N. J., January 7, 1903.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

I have just received your last number of the JOURNAL and was interested in the Newark article, but in some way you have made a grave mistake; you have credited the street department with a yearly appropriation of \$275,000, whereas last year,—the highest it has ever been,—it was only \$119,000. I would be much pleased if I could have \$150,000 to spend, and I ought to have it. Will you kindly make this correction in your next issue?

J. C. MUNDY, *Gen. Supt. of Works.*

The Newark Board of Trade was our authority for the statement that the sum of \$275,000 was appropriated for the street department, and we supposed, of course, that this statement was authoritative. We regret that it is not a fact, especially as we know that Mr. Mundy could make excellent use of that amount annually in the construction and maintenance of the streets in his city.—[EDITOR.]

The Proposed Federation of Municipal Associations

PHILADELPHIA, PA., Jan. 22, 1903.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

Apropos of your valuable and instructive article on "The Value of Municipal Associations," in your January issue, permit me to emphasize your conclusion that there are too many organizations of similar aims and to endorse most heartily your suggestion that some steps toward federation are imperatively demanded. Such steps have already been taken and may be said to lead toward practical results.

Last summer the American Park and Outdoor Art Association appointed a Committee on Federation with representatives of the leading national organizations to devise practical ways and means for bringing the societies having similar ends into closer co-operation to the end that needless duplication and overlapping of effort should be eliminated and the efficiency of all increased.

This committee has devised a plan which will shortly be submitted to the organizations represented for action. To all intents and purposes it provides for a working arrangement somewhat in the nature of a "gentleman's agreement" to harmonize the interests now at times in conflict through lack of information as to what each is doing and to occupy still more fully the growing field of usefulness and endeavors.

The details will be given out in another month but in the meantime much important work can be done through an interchange of ideas between those actively identified with the various bodies most directly concerned and through an agitation of the subject.

I trust the whole question will be discussed by the JOURNAL and given that consideration which its importance demands. I shall be most happy to receive suggestions and trust that the readers of the JOURNAL will not be slow to express their opinion and propose ways and means for putting the idea into force and effect.

CLINTON ROGERS WOODRUFF,

Chairman, Committee on Federation.

Correction in Water Table

INDIANAPOLIS, IND., Jan. 9, 1903.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

In the January, 1903, number, on page 29, I find table of water rates. I notice you give the Indianapolis Water Company a minimum charge of \$16.20, flat rate. Yet there are people in this city getting water for a two-room house for \$3.00 a year; three rooms for \$4.00, and five and six rooms for \$5.00. If we had a minimum charge for all the items you enumerate, it should be \$18.00. You give the maximum meter rate as 18 cents, which is correct; you give the minimum as 7 cents, which is not correct; the minimum is 4½ cents.

I would recommend that in future before publishing the rates of any city that you send out and ascertain if they are correct.

F. A. W. DAVIS, *Vice-President.*

The data contained in the table referred to was found in a rate card sent to us by the Indianapolis Water Company at our request. If our correspondent will examine the figures again he will see that we were in error only in stating the minimum meter rate charged, which we placed at seven cents instead of four and one-half cents. We are glad to note this correction for the sake of our readers, for in the compilation of tables we desire to reach the highest point of accuracy.—[EDITOR.]

Anonymous Attack on Bitulithic Pavement

BOSTON, Jan. 26, 1903.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

I beg to enclose you a signed statement calling your attention to certain attacks made anonymously on the bithulithic pavement and the principles involved therein. The statements made in these anonymous attacks are such gross perversion of facts and with so little regard to accuracy that it seems absolutely necessary that a statement regarding them be given the widest publicity in the engineering profession and the official public.

Appreciating the support given by your publication to the principles involved, and realizing that the future of our business to a great extent rests on the professional opinion of the pavement from a scientific basis, I feel that in turning to you and suggesting the publication of the enclosed statement, or the handling of the matter from an engineering and ethical standpoint, is calling your attention to a subject within the province of an engineering and technical paper.

You must realize that any statement which Warren Brothers Company makes will be discounted by virtue of its interests and I trust you will feel that the matter is of enough moment to the public generally to justify its being handled from an ethical standpoint.

Thanking you for any consideration you may give the matter, and standing read to furnish you with any information, or proofs, in my possession, I remain, yours respectfully.

F. J. WARREN, *President.*

We have known of this anonymous attack on the Warren Brothers Company for some time, as the matter has been called to our attention by several of our city engineering friends who have asked what there was in it. We have invariably replied that, in the first place, the work of the Warren Brothers should speak for itself, which, considered with their good reputation and character which has been maintained for more than twenty-five years, should protect them from any ill effects which otherwise might accrue from this anonymous attack. Judged from an ethical standpoint, the manner in which the attack is made, as portrayed in the subjoined statement of the Warren Brothers Company, is cowardly and contemptible. As the statement of the Warren Brothers Company is over its signature, common justice demands that it be given publicity. If those who are circulating these false reports had sent one of their anonymous communications to us it would have immediately found its way into the waste paper basket, for we give no credence to anonymous communications. We cannot but feel that our readers will treat this anonymous attack in the same way in which we would deal with it ourselves, that is, pay no attention to it whatever, for any person, or concern, who is ashamed to acknowledge his identity in attacking another is unworthy of belief. The statement made by the Warren Brothers Company is as follows.—[EDITOR.]

A PLAIN STATEMENT TO THE PUBLIC

The Asphalt Trust, true to its rule or ruin policy, has had its literary bureau busy for the past several months in writing and circulating, *always anonymously*, volumes of malicious attacks on the "Bitulithic Pavement," otherwise known as "Warren's Patent Bituminous Macadam Waterproof Pavement," for the very reason that this pavement has met with the approval of taxpayers and practical engineers to such an extent that during the past year it has been adopted and contracted for in forty-four American cities, to the extent of over 800,000 square yards; is to-day in the lead in a large number of other cities, and is, therefore, a serious menace to the existence of the Trust.

The anonymous circulars are not only full of misstatements, but attribute to members of this company statements which they never made, and misrepresent by quoting detached sentences and clauses, carefully omitting the context, thereby giving an entirely different expression and meaning to the detached sections.

In answer to such anonymous attacks we prefer to refer, for vindication of us and our pavement (if any vindication is necessary) to the thousands of practical disinterested citizens and officials throughout the country who have used and carefully examined the pavement. If anyone from these classes has condemned our pavement, or stated that it is built on impractical, unsound or unscientific principles, we have not heard from him.

Even the Asphalt Trust, in its Circulars, does not make any such claims, but seeks to prejudice and poison the public mind by attacks which are not based on facts and cannot be substantiated on any technical, or scientific grounds.

Warren Brothers Company is composed of a large organization of practical men, who have grown up with, and devoted their entire business lives to the development of the bituminous pavement industry, having held positions of importance in the practical departments of the Warren-Scharf Asphalt Paving Company and the Barber Asphalt Paving Company and other kindred organizations now merged in the National Asphalt Company, otherwise known as the Trust. The members of Warren Brothers Company have had direct charge of the laying of over one-third of the asphalt pavement of the United States and Canada. They appreciated the weakness of the old asphalt pavement, and "The Bithulithic Pavement" is the result of their combined energy and scientific study. It is not an experiment but a development in the industry and not only provides scientifically accurate means to uniformly give the results which were attained occasionally by haphazard methods in the laying of pavements thirty years old and still in good condition, but in many details improves on them.

To men acquainted with the business, it is a well known fact that the Trust, while doing business in the name of the old organization which built up the industry, is now managed by men, very few of whom have had any considerable practical experience in the bituminous or asphalt industry—nearly all of the financial and practical managers of the business having withdrawn therefrom.

The United States Government has recognized the novelty of our improvement by granting us five independent patents.

The Asphalt Trust by all sorts of anonymous subterfuges, seeks first to make the public believe the Bituminous Macadam Pavement is practically worthless and experimental and, failing in that, seeks to be allowed to lay something "just as good," and to hoodwink the public into letting it use its inferior and cheap Trinidad Lake Asphalt in the construction.

In spite of these attacks, and the methods taken by the once powerful trust, we propose to keep right on in the development and introduction of our bitulithic pavement, trusting that by fair dealing with the public it will not permit us and the pavement to be slaughtered by turning it over to its enemies, and that it will see through the unwarranted attacks which are being made so strenuously but anonymously, and insist in the future as in the past, that if the bituminous macadam or bitulithic pavement is to be laid at all, the work shall be done by the people whose entire interests are involved in making a success of the construction.

WARREN BROTHERS COMPANY,
F. J. WARREN, *President.*

Should Water Taxes Be Paid to City Treasurer?

ROCHESTER, N. Y., January 15, 1903.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

Many of the taxpayers of this city have urged that some plan be devised whereby they can pay their water bills, at the same time they pay their general city taxes, and thus save worry and vexation of spirit, besides loss of time in calling at another department. We formerly collected the sprinkling bills separate, but after a time, arrangements were effected so that they were added to the general city tax rolls each year, and, as they number about 15,000 items, a great saving was made by this action, to say nothing about the accommodation to the public.

While in like manner the flat rate water bills would, without doubt, be disposed of, there is some question as to the handling of the metered accounts in this way. Have you any data on this subject that will help me with the investigation? Do you know of any cities where the Treasurer collects water bills, as well as the General City taxes?

I think it would greatly accommodate the public if all monies due the city were paid to one official, and, as far as possible, at one time.

Any favors you can extend me in the way of information on the above lines will be thankfully received, and I shall be pleased to reciprocate the favor when in my power to do so.

SAM. B. WILLIAMS, *Treasurer*.

We have no data upon the subject and will have to leave it to our readers to reply. On general principles we believe, however, that some plan could be evolved whereby the payment of all monies for whatsoever purpose collected by a city could be made to the City Treasurer, not only at a saving of expense to the city, but a saving of time and annoyance to the citizen.—[EDITOR.]

School Children Help Clean Hartford's Streets

HARTFORD, CONN., Jan. 10, 1903.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

Good results in street cleaning can be gotten by educating the children and bringing the matter of cleanliness in the city streets to their attention, as is done by the use of a school blotter. This was taken up by me several months ago and good results have followed. I have established public waste cans in front of all schools in Hartford. The principals of the schools have taken the matter up individually and are deeply interested, and make this a subject for weekly talks before the pupils in the various schools. The absence of scraps of paper around school yards and in streets in the vicinity of the schools demonstrates what can be done. This, in my opinion, is a step in the right way, and I believe if other cities will take the matter up they will be gratified with the results and feel that they are well repaid for the very slight expense incurred in getting these before the school children.

PHILIP HANSLING, JR., *Supt. of Streets*.

For the benefit of our readers the "Don'ts" are quoted as follows: "A FEW DON'TS THAT IF CARRIED OUT WILL ADD TO THE CLEANLINESS OF OUR CITY"

"Don't throw anything into the street. If you have anything to throw away, put in the waste paper cans on street corners, or into the garbage cans and barrels.

"Don't throw away banana skins or orange peels. They are slippery and cause many accidents.

"Don't tear up waste paper and scatter on the streets.

"Don't scatter the sand heaps in front of buildings in course of erection, as it makes extra work for the street sweepers.

"Don't make slippery places on sidewalks, as it endangers the limbs and life of older people, and your own mother or grandmother may fall on a slide that you have made.

"Don't wait for the man to shovel your walk—shovel it yourself.

"Don't be afraid to throw a little sand or ashes on the slippery places, as it may save some one dear to you from a bad fall.

Superintendent of Streets.

The above is an excellent suggestion and should be widely copied.—[EDITOR.]

How to Assess Cost of Sewer System

NEW YORK, January 15, 1903.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

We have under consideration the question of how best to assess the cost of a sewer system to be installed in the village of Mount Kisco, Westchester county, New York, and are desirous of having before us as many of the different plans of assessments for small towns as we can procure, for the purpose of sifting them and selecting that which we believe would best suit our conditions. We would appreciate it very much if you could put us in line with information of that kind where we can find it, in order that we may go and examine the records.

KELLOGG & SLOSSON, *Counsellors at Law*.

A similar question was answered in the September and October issues of the MUNICIPAL JOURNAL AND ENGINEER for 1902.—[EDITOR.]

Ask for Municipal Lighting Plant

McKEESPORT, PA., Jan. 15, 1903.

Editor MUNICIPAL JOURNAL AND ENGINEER:

The city of McKeesport is wrestling with one of the most momentous problems in her municipal history—that of lighting the city streets with electric lights. The situation at the present time is extremely critical, the councilmen being hopelessly divided with regard to the erection of a city light plant, in the face of the fact that the private corporation that has been furnishing the city light for many years has demanded a five-year contract in place of the old one which has just expired, or it will shut off the lights and leave the city streets in total darkness. That the city is not without light is due to the action of the city solicitor in taking the matter into the county courts and having a temporary injunction issued against the company.

One of the tickets in the field has adopted "municipal lighting," as a platform and the people are flocking to its standard. The fight is being led by City Controller R. A. Hitchens, who is a candidate for mayor, and who has championed the cause of a municipal light plant for years. A strenuous effort is being made to defeat the councilmen who were opposed to a city light plant and to elect men in their places who will pass an ordinance for it. All other issues in the campaign have been lost sight of through the intensity of the struggle for a light plant.

The trouble was precipitated a few months ago when Controller Hitchens advertised for bids for city lighting. The form of invitation was changed, in view of the fact that a city light plant was under discussion in councils, to read "for a term of one year, with the privilege of one or two more," instead of five years. The ordinance in Councils was finally killed in select branch, four votes out of thirty-three being sufficient to place it on the table. Then the light corporation refused to bid according to the invitation and made a proposition for a five-year contract at \$70 per arc light per annum. This was not accepted by the time the old contract expired in December and an ultimatum was submitted by the company, giving the city a few days in which to come to terms, with the alternative of having the lights shut off. The proposition has not been accepted and the court has restrained the Company from carrying out its threat, until equity proceedings can be instituted. The city's side of the argument is based on the franchise given to the light company years ago, which stipulates that the company shall furnish light to the city at seventy-five per cent. of the cost to private consumers, no period of time being mentioned in the article. The Company also bases its case on the franchise, holding that if it is binding upon the Company it is also binding upon the city, being regarded as a perpetual contract. The case is to be argued in court this month.

The rock upon which the councilmen split is the probable cost of equipping and maintaining a city light plant. There is a vast difference of opinion with regard to this important question, the estimates ranging from \$60,000 to \$150,000 for the plant, and from \$5,000 to \$15,000 per year to maintain it. A number of the councilmen claim to have made thorough investigations and to have the advice of experts, but each has different figures to present for consideration and

as a result none of them are very convincing to the people at large. Last year the city paid the Monongahela Light & Power Company \$23,000 for light, requiring about 313 arc lamps. The city is growing rapidly and the cost of lighting it is increasing every year. It is maintained by the advocates of a city light plant that this amount is unnecessarily large, as a municipal plant can be operated at a much smaller figure. Those whose votes killed the light plant ordinance claim to be of the opposite opinion.

What appears to be the most reasonable figures yet produced before Councils are those of Councilman Thomas C. Baldrige, who had them prepared by J. L. Benson, a consulting engineer, of Chicago, Ill. Mr. Benson assures Councils that a modern plant consisting of a pole line fifty miles long, 300 enclosed arc lamps, buildings and ground, two water-tube boilers, induced draft outfit, tank, heater, pump, piping, one tandem compound medium speed engine, 380 H. P. capacity, and four 110 light dynamos, can be secured at a total cost of \$54,000. Mr. Benson figures the operating expenses at about \$13,350 per year. Considering it as a bonding proposition Mr. Benson states that, allowing five per cent. interest on \$60,000 worth of bonds, at the end of twenty years the city will have paid out \$349,500. At the present rate of lighting the city will pay out at least \$420,000 during that time.

X. Y. Z.

Personalities

—City Engineer J. P. Thomas, of Watervliet, N. Y., writes that Abraham Hilton was re-elected mayor of this city by an increased majority.

—The grand jury at Crookston, Minn., recently indicted City Treasurer Al Coons of East Grand Forks, for the alleged embezzlement of \$3,400.

—On December 5th the municipal elections were held in Dawson City, Y. T., and R. O. McLennon of Vancouver was elected mayor by a small plurality.

—City Engineer J. P. Morrissey of Dunkirk, N. Y., writes that the council has unanimously appointed him city engineer for 1903, this being the fourth consecutive appointment.

—After a long illness City Clerk John Haggerty of Hoboken, N. J., died at the close of the past year. From the time he first voted Mr. Haggerty was an active politician and had held the office of city clerk for several years.

—The following officers have been elected by the new Council of Saginaw, Mich.: City Attorney, Henry E. Naegely; Comptroller, Frank M. Lotten; Clerk, William H. Barton; Health Officer, Dr. M. D. Ryan; President of the Council, George Holcomb.

—Mayor C. G. Jones of Oklahoma City, Okla., visited St. Louis not long since with the heads of his departments and the Council of the city for the purpose of studying the municipal machinery of St. Louis that they might improve that of their own municipality.

—While Mayor George P. Sullivan of Derby, Conn., was elected by the labor unions' efforts, thus far his acts have been such that his administration could hardly be called a labor union one. In his appointments he has ignored practically, organized labor.

—The people of Toronto, Ontario, have decided to have another chief magistrate in place of Mayor Howland, and at the recent election voted in Alderman Urquhart by a big plurality. The mayor-elect is a prohibitionist and many of the votes cast for him were on that plank.

—While D. W. H. Moreland, Commissioner of Public Works at Detroit, was attempting to cross an icy pavement he slipped and broke his ankle. A touch of the grippe has been added to this other misfortune and the Commissioner will not be able to attend to his duties for some weeks to come.

—The elections for mayor in some Canadian towns and cities resulted as follows: Port Arthur, Ont., George Clavet; Ottawa, Mayor Cook, re-elected; London, Mayor Beck, re-elected; Kingston, Dr. J. B. Bell; Hamilton, W. J. Morden; St. Thomas, C. F. Maxwell; Sault Ste. Marie, W. H. Plummer.

—The newly elected council of Schenectady, N. Y., selected the following officials for the city: City Attorney, William P. Nolan;

City Clerk, Alexander Fenwick; City Marshall, James Shannon; City Engineer, Charles W. Trumbull; Superintendent of Streets, John F. Mahar; Water Commissioner, Alonzo Peters.

—Abraham S. Hewitt, who was mayor of the city of New York in 1887-8, died last month, after a lingering illness due to an attack of jaundice. While Mayor Hewitt was a Democrat and was elected on the Tammany ticket, his nomination was a concession to the better element in his party, and all factions lament his death as that of a man of the greatest ability.

—Mayor Seymour Egbert of Bayonne, N. J., recently announced the following appointments of officials: City Surveyor, Emmet Smith, at a salary of \$4,000; City Treasurer, Nathaniel W. Trask, at a salary of \$2,500; Street Commissioner, Thomas B. Melton, at a salary of \$2,400; City Clerk, William C. Hamilton, at a salary of \$2,250; Chief of Police, Thomas Magner, at a salary of \$2,000.

—The Republicans of Philadelphia, Pa., have nominated for Mayor, John Weaver. As the nomination in that city by the Republican machine is equivalent to an election, Mr. Weaver will doubtless be the next mayor of the city. Surprising as it may be, Mr. Weaver will have the support not only of the machine but also of the Municipal League, which has been fighting the organization for some time. In opposition to Mr. Weaver, the Democrats nominated Mr. Francis Fisher Kane.

—The trial of Mayor Fred F. Venderberg, City Clerk William P. West and Commissioner of Streets John Strycklin of Brooklyn, Ill., ended in a verdict of guilty against the three. The charge was malfeasance in office and conspiracy to defraud the city. The Mayor and the Street Commissioner received terms of imprisonment in the penitentiary, while the punishment of the City Clerk was left to the court. Systematic schemes of defrauding the city by means of bogus employees and the raising of warrants were proved against them at the trial.

—An attempt to raise the salary of the Mayor of Worcester, Mass., has been frustrated by the action of Mayor Edward F. Fletcher, who vetoed the resolution to that effect. Mayor Fletcher believes in maintaining a rigid economy in municipal affairs, and as the raise in salary would affect him personally, he refused to accept it. While the Mayor recognizes that men capable of performing the duties of mayor can earn a larger salary than that paid to the head of the municipal government, he considered that it would be an evil day when the salary of the office was large enough to be tempting as a money prize.

Convention Dates

FEBRUARY

The National Brick Manufacturers' Association will hold its seventeenth annual convention at Boston, Mass., February 4-7. Theodore A. Randall, Secretary, Indianapolis, Ind.

The sixth annual convention of the League of Ohio Municipalities will be held at Dayton, O., February 10, 11 and 12. Dr. S. O. Giffin, Secretary, Columbus, O.

American Road Makers meet in annual session at Detroit, Mich., Feb. 13-14. W. S. Crandall, Secretary, 253 Broadway, New York.

The Ohio State Police Association will hold its annual meeting at Cleveland, Ohio, February 3rd.

The State Conference of Charities and Correction will be held at Lincoln, Nebraska, February 5-6. John Davis, State House, Lincoln, Neb.

The Connecticut Society of Civil Engineers will meet at Hartford, Conn., February 10th. J. Frederick Jackson, Box 1304, New Haven, Conn.

The Virginia Charities and Corrections State Conference will be held at Norfolk, Va., February 10-12.

The Wisconsin State Gas Association meets at Milwaukee, Wis., Feb. 11-12. H. H. Hyde, Racine, Wis.

A National Convention to discuss municipal ownership and public franchise will be held in New York City in February.

The Illinois State Union of Police Chiefs will meet at Bloomington, Ill., in February.

RECOMMENDATIONS OF MANY MAYORS

Reform in Methods of Taxation Urged by Many—Home Rule for Cities Demanded—New Charters Are Greatly Desired in Some cities—Much Improvement Work to Be Done

NEW CHARTER NEEDED IN MINNEAPOLIS

The greater portion of Mayor Haynes' address was devoted to the need of a new city charter. The extension of the civil service system in the various departments, the introduction of voting machines and the auditing of accounts by some authorized board were recommended. The need of a filtration plant is being felt as the pollution of the Mississippi continues and the Mayor recommended that a sinking fund be started at once so that in a few years enough money will be on hand to build it.

MAYOR BAUM WANTS AN ELECTRIC PLANT

A bill for the issue of \$50,000 bonds for the purpose of completing the fund of \$125,000 for a municipal electric light plant is recommended by Mayor Baum of Saginaw, Mich. All the wires in the city should be placed underground, the city owning the conduits and charging rental for their use. For the erection of street signs, \$1,500 should be appropriated, grade crossings should be abolished and efforts should be directed towards creating "the city beautiful." The remedy for "ripper" legislation lies in home rule charters for the cities and the Mayor is strongly in favor of them.

A CITY BUILDING NEEDED

Mayor Phinizy, Augusta, Ga., recommended the auguration of a sinking fund and suggested again the need of a city building and central market. According to the Mayor every department of the city government is in splendid condition.

CORPORATIONS SHOULD PAY FOR FRANCHISES

Mayor McCormick, Harrisburg, Pa., urged upon Council the passage of the general paving ordinance which has been under consideration. A sinking fund should be provided by a tax of seven and one-half mills for the purpose of paying for the improvement loan as well as for the ordinary expenses of the city. The control of the highways should be placed under the City Engineer according to the Mayor. He urged legislation to compel people who excavate in the streets to secure permits for the right and to pay enough for the permit to enable the city to restore the pavement in its original form. A paid fire department was strongly recommended as a necessity. Mayor McCormick thinks that the companies supplying the people with transportation, light and power do not pay the city enough for their privileges and recommended that steps be taken to compel a better return to the city for these franchises.

WATER FILTRATION RECOMMENDED

Mayor Lewis, Allentown, Pa., reviewed the history of the acquisition of Schantz's Spring for increasing the water and mentioned that, while the water will not be sufficient for a full supply as expected, if means are taken to prevent all waste, sufficiently pure water will be had for some years to come. House sewerage is to be voted upon at the next election and this will help to keep the water pure; but filtration, according to the Mayor, is the only safe means. A new hook and ladder truck was urged for the fire department. All public work should be thrown open to free competition as the city would be the gainer thereby.

REFORM IN TAX RECOMMENDED FOR BUFFALO

An entirely new assessment is to be levied during the spring. Mayor Knight of Buffalo, N. Y., considered that this will bring about a fairer condition of taxation and all the corporate interests must be treated in proportion as the smaller tax-payers. He recommended that a board of review be established to which the assessment rolls should be submitted and to which those that consider themselves unjustly assessed can apply for proper adjustment. In view of the immense amount of swearing off of personal taxes, measures must be taken to stop it. He suggested that the board of review receive all applications for reduction of personal taxation and compel each applicant to swear to a written statement which shall become a public record open to the inspection of all. Grade crossing

problems, reform in the method of paving and repaving reduction in the expense of running the water department and the antiquated system of preparing and passing upon the estimates are the main points in the Mayor's message. Respecting the last, he urges that the mayor be allowed to pass upon the estimates for the fiscal year so that he may eliminate such items as seem to him unnecessary. A better system of street cleaning and investigation into the subject of a municipal lighting plant or cheaper lighting were also recommended.

BOSTON WILL SOON REACH DEBT LIMIT

Mayor Collins called attention to the way in which the city is getting deeper and deeper into debt. During 1902 the debt had been increased \$3,237,833, due in great measure to loans for schools and parks. He recommended the appropriation of \$1,500,000 for new schools and sites and, as only a little over \$1,000,000 will be left for improvements of all kinds, great care must be taken in selecting the objects.

A SOCIALISTIC MAYOR

The principles of Socialism were advocated by Mayor Coulter of Brockton, Mass., in his address. He said, "I do not believe corporations should be granted the use of public streets for private profits." The abolition of the contract system on public buildings should be secured and only union labor employed in all branches of work. A municipal ice and coal plant should be installed. Appropriations should be made for a public park, bath and comfort houses and a high school, but no money should be spent for an armory.

FAVORS FIXED SYSTEM OF PAVING

Revision of the city charter and ordinances of Fitchburg, Mass., was one of Mayor Blood's recommendations. He also favored creating the office of police inspector, a fixed system of paving and the appropriation of not less than \$10,000 for the next three years that contracts may be made in advance for paving block. He urged that a high pressure main for fire service should be installed as soon as possible.

MACADAM FOR LIGHT TRAVELLED STREETS

Mayor Everett E. Stone, Springfield, Mass., sounded a warning note of economy as the debt limit was rapidly being reached. Some permanent street work should be done and streets subject to light traffic should be macadamized. He advocated nominal salaries only for members of commissions and that more authority should be given the superintendent of water works.

EIGHT HOURS ENOUGH FOR WORK

Mayor Fletcher, Worcester, Mass., urged again the abolition of grade crossings. He advocated an eight hour work day and considered it the duty of officials to see that every dollar expended for labor brings the just amount that can be obtained.

VACANT LOTS FOR PLAYGROUNDS

The street cleaning department of this city has done good work during the last year according to Mayor Lankering of Hoboken, N. J. He advocated the fitting out of vacant lots as play grounds for children and better care of the public parks.

INTERCEPTING SEWER FOR ALBANY

Mayor Charles H. Gaus, of Albany, N. Y., recommended the building of an intercepting sewer, the extension of the electric lighting system, new police station and fire houses, the removal from sidewalks of all obstructions and the equipment of all heavy draft wagons with wide tires.

LARGER WATER SUPPLY NEEDED

The additional water supply for Rochester, N. Y., was discussed at length by Mayor Rodenbeck. He said that the city could supply water from Lake Ontario as well as a private company and the water rates could then be reduced for manufacturers for the cheaper grade of water furnished. The price of gas was reduced from \$1.25 to \$1.10

during the past year and will be sold at \$1 after April 1. To keep up the quality, however, the Mayor recommended that it should be tested from time to time. Under the new contract the prices for arc street lights are \$78.50 for single and \$66.61 for double arcs, the old prices having been \$91.25 and \$75 respectively. The street railways should either reduce the fare or pay more for their privileges. A supervisor of all wires in the city was recommended. Municipal ownership of conduits for electric wires was proposed, for the use of which the companies should pay a fair rental and an amount to provide a sinking fund. A uniform system of book-keeping was recommended by the Mayor and the erection of more public baths urged.

EXTRAVAGANCE CONDEMNED

In his seventh annual address Mayor Patrick J. Boyle, of Newport, R. I., condemned extravagance in city affairs. He advocated the taxation of personal property, protection of the city's interests in the matter of granting of franchises, abolition of superfluous city offices and the repeal of the police commission.

HOME RULE FOR CITIES DEMANDED

Mayor Higgins advocated the pension system for the police department of Pawtucket, R. I., and an increase in the force, selection of assessors by direct vote of the people and reform in the methods of taxation, abolition of grade crossings and freedom from interference of the State legislature in city affairs.

SCIENTIFIC SYSTEM OF TAXATION RECOMMENDED

Among the recommendations of Mayor Miller of Providence, R. I., were, the scientific system of taxation, large appropriations for highways, repeal of the police commission act and appointment of department heads by the mayor. He deprecated the mortgaging of the future to pay current expenses by issuing bonds.

Franchises for Cities, Towns and Villages

A COMMITTEE composed of five of the leading lawyers of St. Joseph, Mo., was appointed by Mayor Borden to draft a bill to be presented to the legislature of the State making it obligatory on the part of municipalities to put certain provisions in franchises. City Councilor Kendall B. Randolph, a member of the committee, has forwarded to THE MUNICIPAL JOURNAL a copy of the proposed bill, the provisions of which are as follows:

Section 1. No city of the second class shall hereafter grant, extend or renew any franchises to any steam railway, street railway, water company, heating company, telephone company, telegraph company, lighting company or other company or person for any business or purpose whatever, where the use of any of the streets, alleys, or public places of such city is a feature of such franchises, unless the following conditions are made a part of such franchise.

Franchises granted to Steam Railways shall provide that the company obtaining such franchise shall pay for all sections of main or district sewer thereafter constructed under their right of way, or under any street occupied by their tracks or switches, the same to be paid for by such railway company for the full width of such right of way or street. If such right of way or street is occupied jointly by two or more railways they shall pay jointly for such sewer in proportion to the number of tracks each shall have at such place.

Also that they will when required so to do by ordinance grade, pave, construct or reconstruct all crossings to the full width of their right of way with such material and at such time or times as may be required by ordinance, and will also lay sidewalks of such material and at such time as shall be required by ordinance at all their railway crossings to the full width of their right of way, and that they will whenever their right of way or other lands abut or lay alongside of any public street or alley pay for grading, paving, constructing or reconstructing and laying sidewalks on the same as though their said property was the property of any other person or corporation, and that they will maintain watchmen and gates at any and all crossings when required to do so by ordinance, and will construct and maintain viaducts or subways at the option of such city at any and all crossings when required to do so by ordinance, and that such steam railways shall be subject to all laws and ordinances then existing or thereafter enacted.

Such franchises shall also provide that in case any of the improve-

ments aforesaid shall be done under contract let by the city that the cost of all such work shall constitute a lien against all the franchises, rights and property of such steam railway in such city, and may be collected by suit in any court having competent jurisdiction.

Section 2. Franchises granted to street railways shall provide that they will pave between the rails and eighteen inches on each side thereof of all their tracks with such material and at such times as may be required by ordinance.

Section 3. All franchises granted to any person, firm, association or corporation for the placing of wires along any of the streets or alleys of the city shall provide that whenever required by ordinance so to do all or any part of their service wires shall be placed in conduits under the surface of the ground, and all or any of their poles shall be removed from such streets and alleys.

Section 4. All franchises granted to any person, firm, association or corporation whose business requires or makes necessary or expedient the laying of pipes or conduits under the surface of the ground shall provide that after any excavation has been made by them in any public place that they shall pay into the city treasury the sum of two dollars and fifty cents per day to be used as reimbursement for the wages of an inspector to be employed by the city to inspect the filling of such excavation and the replacing of the paving and sidewalks.

Section 5. All franchises shall provide whenever applicable that they will file with the city engineer plans of all pipes and conduits under ground and of all poles and overhead wires the same to be and become public records.

Section 6. All franchises shall provide for a period of duration not exceeding thirty years.

Section 7. All extensions in the nature of renewals of any and all franchises now or hereafter existing, shall be granted only on condition that as rental for the privileges granted by the city, the person, firm, association or corporation, their successors and assigns obtaining such extension of franchise shall pay into the city treasury of such city annually on the 1st day of May a sum of money equal to three per cent. of the gross earnings of the person, firm, association or corporation using such franchise, and derived from the use thereof, for the twelve months next preceding the 1st day of April in each year.

Section 8. All original franchises shall provide, that as rental for the privileges granted by the city, the person, firm, association or corporation, their successors and assigns, obtaining such franchise, shall until the first day of May, 1908, pay into the treasury of such city, annually, on the 1st day of May a sum of money equal to one per cent. of the gross earnings of the person, firm, association or corporation using such franchise and derived from the use thereof for the twelve months next preceding the 1st day of April in each of such years, and thereafter for the next ensuing five years shall at like times and in like manner pay one and one-half per cent. of its gross earnings, and thereafter for the next ensuing five years shall at like times and in like manner pay two per cent. of its gross earnings, and thereafter shall pay three per cent. of its gross earnings.

Provided, however, that the provisions of this section may be suspended for ten years as to proposed street railway lines whenever the owners of a majority of front feet along the streets proposed to be occupied by such street railway line, shall present to the mayor and municipal assembly of such city a petition in writing therefor, and if the owners of two-thirds of the front feet along such streets shall petition therefor, the same shall be suspended for a period of ten years, during which period no sum as rental, as above provided, shall be required to be paid.

Oiling the Streets of South Pasadena

SOUTH PASADENA, Cal., was one of the first municipalities in the State to adopt the use of oil for street sprinkling purposes. For five years the streets of this city have been treated with crude petroleum, and the accumulative effect of the oil is readily observed. By using a low grade of oil the best results have been secured. Some of the oil has washed away during the winter rains, and some has evaporated, but there is an asphaltum base which gives the effect and

appearance of asphaltum pavement in many places. Frequently this tough crust is two or three inches in thickness. Most of the soil in the city is full of gravel, and this seems to give the most satisfactory results, although it has done quite well on adobe or yellow clay.

The use of oil on roads is yet to some extent in the experimental stage, though many valuable points have been ascertained within the past few years. It has been pretty thoroughly demonstrated here and elsewhere in this vicinity that the use of oil is much more economical and that the roads are kept in better condition with the oil. In South Pasadena the oil, 14 gravity, costs 85 cents per barrel, delivered on the roads as needed, and at the points designated by the street superintendent. The combined sprinkler and harrowing machine is fastened behind the tanks and the oil applied hot, after which it is worked in with the machine. It is heated by steam at the tanks in Los Angeles, six miles away, and retains the heat very well until it arrives in this city for sprinkling. It is better, if possible, to have it heated to 175 to 200 degrees Fahrenheit before being applied to the street. While heated it is readily incorporated with the surface, and the unpleasant effects of driving through it are lessened.

In some instances in this vicinity an ordinary sprinkling cart has been employed to put the oil on the road, but this has not proven altogether satisfactory. The dust should not be too deep, however, before the oil is applied, and in case it runs in puddles in places it is well for a man to follow with a shovel, putting sand or dust in the pools. In building roads for oil it is best not to make the crowning too pronounced. In portions of California where the rainfall is light it is necessary only to have a gentle slope from the center of the street to the curb line. This allows the oil to be distributed better with the available oiling appliances, and it is less likely to run into pools. The streets are better, at any rate, without too much crowning, for it forces all the travel into the middle, making ruts, and the road does not wear evenly. The heavily loaded vehicle on the slope is inclined to slide outward, cutting the road bed. Experience has shown this to be a fact, regardless of the use of oil.

On sections of the road which are subject to much heavy traffic there is often much difficulty in getting the surface compact and solid, either with water or oil. The main avenue between Los Angeles and Pasadena passes through South Pasadena, and this has a great amount of travel. Nothing short of macadamizing will make a good road on this section, and we have had much difficulty in getting a good road bed on this portion. In places it is a task to get a hard, smooth face and the tendency is to wear it two or three inches deep in dust. The dust is heavy and does not fly at the start, but the oil soon evaporates to a great extent, and then it is as bad as ever. To remedy this we applied water plentifully as soon as the oil was well worked into the dust, and while it is generally supposed that oil will not mix with water, the result is surprising, giving a very good and compact surface. The addition of water after the oil is thoroughly incorporated is quite beneficial in a sandy or very dusty road bed. Water should be put on before the oil also, if possible, for a few days to make the road bed solid, and in this way save much oil.

By all means it is advisable to shut the road to travel while the oiling is being done, and until it is in good condition for travel. If this cannot be done, fix one side of the road at a time, closing that portion to travel. This means a great saving of oil, and results that are far better. It is one of the most important suggestions to bear in mind.

While the city of South Pasadena would not think of returning to the use of water, it is generally hoped that some better appliance for sprinkling the oil will be devised. There are serious objections to those in use so far.

South Pasadena has about ten miles of streets which are treated with oil, and we have used about 1,200 barrels a year. This year, however, it is the intention to put on about 500 barrels extra in the fall—sometime before the winter rains set in. The custom has been to apply the oil in the early summer. The extra oil this year will be used on the streets which have the heavier travel this autumn. Where the travel is light it will not be needed. It will be the policy in the future also to oil to the curbs. This will cost more money, but it will prevent washing and keep the weeds down.

The city of South Pasadena has about \$1,200,000 assessed valuation,

the Raymond hotel, ostrich farm, and other valuable property being in our city limits, and the funds are ample without a high tax rate for keeping the roads in good condition. In fact the streets here will compare favorably with those of any city of the same size in the state. The city has no debt, considerable money in the treasury, and it is hoped in the future to expend the money raised by taxation principally on the streets. Much of it will go for crude petroleum.—Walker Jones in *California Municipalities*.

Central Park Damaged by Neglect

IN the fall a commission of experts was requested by Park Commissioner Willcox, of New York, to examine Central Park and determine how far it had deteriorated. The commission consisted of Dr. N. L. Britton, director of the New York Botanical Garden, Dr. B. E. Fernow of Cornell University, Superintendent J. A. Pettigrew of the Boston Park Department and Mr. Samuel Parsons, Jr. The commission found the park in rather poor condition and assigned their reasons for this. According to the commission, one cause of damage to the trees has come from overcrowding. At least twenty years ago the trees should have been thinned out and all cuts of branches should have been protected from the air so as to have prevented the access of fungus. Wide-spread rot has been the result of this lack of skill in trimming. The borders of the park are, in many places, so bare of trees that street life is disagreeably apparent. The simple effect of woodland has been destroyed by indiscriminate planting of incongruous material in beautiful glades and opening in the woodlands. The shrubbery is dilapidated and the growth weak as a result of overcrowding and lack of proper cultivation. By the removal of the leaves from the ground, valuable fertilizing material has been lost as well as the natural appearance of the woods.

The commission's recommendations, in addition to those implied in the foregoing, are as follows:

The removal of short-lived trees and those not suitable for city conditions, such as poplars, hemlocks, pines, spruces and retinosporas. Conifers cannot endure the smoky air of dense cities. The amount of California privet should be very much reduced.

A clearing out of all trees, shrubs and herbaceous plantations in open glades and from bays in the foliage lines.

The regular application of manure and commercial fertilizers to the groves, plantations and lawns, and the addition of top soil in certain limited areas in which the rock comes close to the surface where new shrub planting is to be done.

Plant and thicken border plantations where necessary, using for this purpose such trees as English elms, oaks, ginkgos, plane trees, lindens and sweet gums.

Improve the margins of woodlands by appropriate plantings of such native shrubs and small trees as thorns, dogwoods, viburnums, red-buds, shadbush and witch hazel. The fruits of many of these are very attractive in the fall and serve as food for numerous songbirds.

The construction of a system of water distribution for the irrigation of lawns and newly planted grounds.

It is clear from our study that an immense amount of work will be necessary to put the Park in a healthy condition and that it should be done at once.

Cost of Macadam in a Small City

THE cost of laying macadam pavement on Luzerne avenue in West Pittston, Pa., is given in the report of the street commissioner, Mr. W. C. Sutherland. It demonstrates the value of using the proper materials for street paving in connection with modern road building machinery. The Good Roads League of Luzerne County loaned the borough the machinery and so this item must be allowed in making out the cost of the pavement.

Sandstone was used for the bottom course and trap rock for the surface because of the better wearing qualities of the latter stone. The total number of square yards paved amounted to 18,088 and the cost of grading, including the salary of the engineer, was \$1,387.34, or 7 2/3 cents per square yard. The cost of macadamizing itself was \$7,700.93, or 42.6 cents per square yard and was divided into the following items:

1,506.89 tons No. 3 sandstone, at 50c per ton.....	\$ 753.44
170.99 tons No. 1 sandstone (screenings), 20c per ton.....	34.20
Freight on 1,677.88 tons sandstone, 30c per ton.....	503.36
Delivering 1,677.88 tons sandstone on street, 30c per ton....	503.36
3,545.48 tons limestone, 60c per ton.....	2,127.29
Freight on 3,545.48 tons limestone, 30c per ton.....	1,063.64
Delivering 3,545.48 tons limestone on street, 25c per ton...	886.25
Salary W. C. Farrington, engineer in charge.....	691.03
Engineer on road roller.....	194.36
Coal for road roller.....	136.45
Labor, at \$1.50 and \$2.00 per day.....	670.55
Team on sprinkler, \$4.00 per day.....	137.00

Together with the cost grading, the total cost of laying the pavement was fifty and one-quarter cents per square yard. The total amount of stone used was 5,223.36 tons and the average thickness before rolling was eight inches. The total cost of laying the macadam \$9,088.27, was reduced by the amount charged the railway companies and the value of the dirt and stone sold, \$249.81, or \$8,838.46, the net cost to the borough.

Good Roads and Good Schools

THE advantage of good roads to dwellers in the country districts lies not alone in greater ease by which crops can be transported to the distributing centres and towns. They play a great part in the education of the children of these districts inasmuch as the more the children can be drawn together in large central schools the better can they be educated. With a number of small schools scattered over the rural districts it is too expensive to provide much more than instruction in the rudimentary branches, but if the children can be brought together in large central schools, the cost of instruction is divided among a greater number and more branches can be included in the curriculum. As is pointed out in the following extract from the report of Superintendent of Public Instruction Charles R. Skinner, of New York State, it is impossible to bring the children together unless the roads are in good condition.

"The arguments thus far advanced in the commendable agitation for good roads have not considered the welfare and comfort of our school children as a factor.

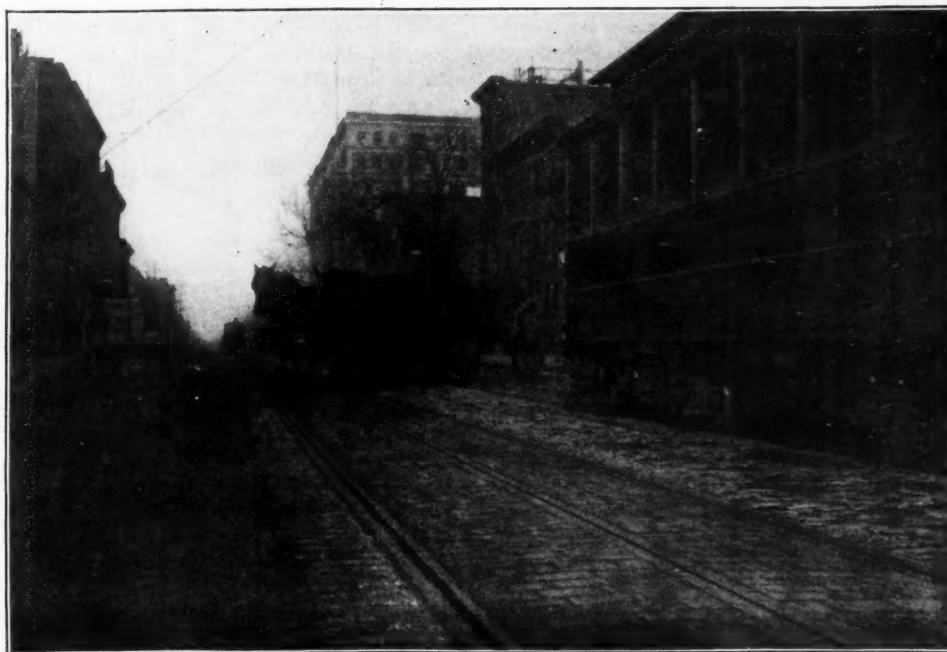
"The farmer is told that good roads will put money into his pocket by saving his horses and wagons, that the value of his farm will be enhanced, and the trip to town or to church will be a pleasure rather than a burden. The merchant is assured that his trade will mightily increase if good roads lead to the village. The bicyclist knows by an occasional run over rare sections of well-built highway what comfort would result if good roads were the rule instead of the exception. Those who are able to indulge in the luxury of automobiles also see pleasant visions. Nothing, however, has been said about the children as they go through the mud or dust, up hill and down, from their homes to the schoolhouses one to three miles distant. Is it unreasonable to believe that these men and women of to-morrow would prefer well-graded, macadamized roadbeds to the miserable pretences for highways which now disfigure so much of our landscape? It is not difficult to imagine the country school a much happier and busier place if the children could gather after pleasant walks along well-built and well-kept highways.

"What to do with our country schools is becoming a serious problem as the years go by and the rural districts become more sparsely settled. When more than thirty per cent. of our rural schools have an average daily attendance of less than ten children something should be devised to put a stop to such needless waste.

Combination of resources and capital cheapens production and results in an improved product. It is the opinion of educators that a reasonable application of this principle to our rural school problem would result beneficially. With the present condition of country roads the transportation of the children to central, well-equipped schools is practically impossible during most of the year. Good roads would remove a serious obstacle to this most important step forward in the improvement of our country schools. The boys and girls of the country with one accord demand good roads, that they may enjoy school privileges equal to those of their brothers and sisters in village and city."

Wood Block as Durable as Granite

THE best quality of granite block is generally believed to be the longest lived pavement that can be laid. For this reason it is selected for use, almost invariably, upon all heavily travelled streets, in cities large and small. It costs more, but it is considered more economical to use it because of its longer life and the ease with which it can be taken up and relaid—it lasts from ten to thirty years, according to the amount of traffic. It would seem to be absurd to claim an equal or greater durability for any kind of a wood pavement, but the general practice in England and on the Continent is to use wood block instead of granite for all heavily travelled streets.



CREO-RESINATE WOOD BLOCK BETWEEN RAILWAY TRACKS, HUDSON STREET, NEW YORK CITY

Strange to say it is claimed that better results are secured with wood than with granite.

The experience with wood pavements in this country has been exceedingly unfortunate, and all because inferior material has been selected and bad methods used in laying this kind of pavement. The recent—that is, within the past five years—introduction of better material and correct methods give good grounds for changing this bad opinion of wood, so that it is likely to become one of the most popular pavements, particularly where the traffic is heavy. To test its quality of durability the Chief Engineer of the Metropolitan Traction Company, New York, has had a strip of wood pavement laid between the street railway tracks on Hudson street, where the traffic is exceedingly heavy. In this particular spot, the best granite block has never lasted longer than one year and a half, and oftener for a shorter period, sometimes less than a year. Along side the wood block pavement, in the parallel track, is laid an equal amount of granite. The two strips of pavement have been down nearly three months and the wood block appears to be standing the hard usage as well, if not better, than the granite block.

The granite pavement was laid with the best material procurable after the most approved methods, and the other with carefully selected wood block which was subjected to the creo-resinate treatment, a process which adds to the density of the block, at the same time making it impervious to water and perfectly sanitary. The heaviest trucking in New York passes through this street and it is almost wholly confined to the limits of the two car tracks, which accounts for the rapid wear of the pavement. The accompanying illustration was made from a photograph taken by our staff photographer of the MUNICIPAL JOURNAL AND ENGINEER, and shows up to advantage both strips of pavement and also the granite pavement on either side of the tracks. This has already been down several years, and while it is not subjected to the heavy traffic of the other its bad condition is apparent. When once the enduring qualities of wood are clearly shown by usage in American cities it will rapidly supersede granite block because of its noiselessness.

Some Facts About Buffalo

THE value of the land on which stands the city hall of Buffalo, N. Y., shown in the accompanying illustration, is placed at \$257,400, while the building itself is valued at \$1,350,000, making the whole property worth \$1,607,400. The Hall has a frontage of 372 feet with a depth of 346. For the year ending June 30, 1902, the fund necessary to maintain this building was estimated at \$22,500.

In the building are housed the offices of all the city officials and county officers as well as the different parts of the Supreme Court, the County Courts and all the officials accessory thereto.

In 1900, the city of Buffalo had a population of 352,387 showing a growth of 96,722 during the ten years since the last census and, based on this rate of growth the city at the present time should contain



CITY HALL, BUFFALO, N. Y.

over 376,500 persons. This is a material increase and places Buffalo over both Cincinnati and San Francisco in point of numbers when both of these places were considerably larger at the taking of the census of 1890.

The city is under a bicameral system of government, there being a Board of Councilmen and a Board of Aldermen. There are nine councilmen, and one alderman for each of the twenty-five wards into which the city is divided. Reference to the last report of the Comptroller, Mr. Frederick H. W. Heerwagen, shows that the resources of the city including real and personal property, taxes, sinking funds, etc., amount to \$26,311,864.79 against which must be placed liabilities of \$17,098,145.06 for bonded debt, and \$282,828.87 for tax sales certificates for which bonds are yet to be issued. This left an excess of resources over liabilities of \$8,930,890.86 for the year ending June 30, 1902. The cost of running the government last year amounted to \$7,223,775.07 and the total amount paid into the treasury during the year was \$8,369,417.17.

Statistics of Are Lighting in United States Cities and Towns

	Population, 1900.	No. lamps.		Watts at lamp terminals.			Hours burn per year.	Cost coal per ton.	Contract price per lamp per year.
		Open.	Closed.	Open.	Closed.	Schedule.			
CONNECTICUT									
Bridgeport	70,996	463	...	340	...	(1)	4,000	\$3.50	\$91.52
Bristol	6,268	64	...	340	...	(2)(3)	1,716	3.50	78.00
Danbury	16,537	116	10	340	...	(2)(4)	1,700	4.15	68.00
Greenwich	2,420	89	...	340	...	(1)	4,000	4.00	100.00
Meriden	24,296	192	...	480	...	...	3,300	4.50	110.00
Middletown	9,589	130	...	480	...	(2)	3,000	3.95	100.00
New Britain	25,998	142	...	340	...	(1)(2)	4,000	4.05	90.00
New Haven	108,027	500	...	340	...	(1)	4,000	3.50	91.25
New London	17,548	187	...	340	...	(1)	4,000	...	95.00
New Milford	4,000	23	...	340	...	(1)(2)	2,179	4.10	90.00
Putnam	6,667	...	46	...	430	(2)(4)	1,700	4.50	92.60
Rockville	7,287	80	...	340	...	(2)(3)	1,220	4.50	75.00
Seymour	3,500	30	...	340	...	(2)(3)	1,385	W. P.	70.00
So. Norwalk	6,591	103	...	340	...	(1)(2)	3,342	3.40	62.00
Thomaston	3,500	30	...	340	...	(2)(3)	1,200	4.50	66.12
Thompsonville	5,000	35	...	480	...	(2)(4)	2,100	4.65	75.00
Wallingford	6,737	...	83	...	430	(2)(4)	1,567	4.19	56.80
West Winsted	6,804	90	...	340	...	(1)	4,000	W. P.	80.00
Willimantic	8,937	84	...	340	...	(1)	4,000	4.25	97.11
DELAWARE									
Middletown	1,567	...	2	...	550	(1)	3,650	3.20	102.00
Milford	2,500	...	4	...	550	...	3,700	3.58	75.00
Wilmington	76,508	265	...	480	...	(1)	4,000	3.10	100.00
DISTRICT OF COLUMBIA									
Washington	278,718	1,076	1,002	480	...	(1)	3,943	3.05	72.00
FLORIDA									
Jacksonville	28,429	163	...	...	...	(2)	2,179	3.00	z
Lakeland	1,180	...	5	...	550	(3)	1,460	Wood	90.00
Ocala	3,380	38	5	340	...	(2)	2,179	Wood	z
Port Tampa	1,367	20	...	340	...	(1)	4,000	4.75	186.00
St. Petersburg	1,575	...	5	...	430	(3)	1,825	Wood	72.00
Tampa	15,839	...	63	...	430	(1)	4,000	Wood	120.00
GEORGIA									
Americus	7,674	75	...	340	...	(2)	3,200	2.90	59.66
Athens*	10,245	117	...	480	...	(2)	3,000	W. P.	43.50
Atlanta	89,872	...	716	...	480	(1)	4,000	2.48	82.50
Augusta	39,441	350	...	480	...	(1)	4,000	W. P.	70.00
Bainbridge	2,641	32	...	480	...	(1)	3,656	Wood	75.00
Brunswick	9,081	47	...	480	...	(1)	4,000	3.45	84.00
Carrollton	1,998	...	8	...	430	(1)	4,000	2.30	96.00
Cedartown	2,823	30	...	...	...	(2)(3)	1,220	1.25	z
Columbus	17,614	153	...	480	...	(1)	4,000	W. P.	50.00
Cordele	3,473	...	23	...	550	(2)	2,600	Wood	100.00
Dawson	2,926	56	6	340	430	(2)	2,179	2.70	z
Dublin	2,987	37	...	...	...	(2)	2,179	Wood	z
Fitzgerald	1,817	...	32	...	430	(2)(3)	1,135	Wood	z
Griffin	6,857	54	5	480	430	(1)	4,000	2.55	z
La Grange	4,274	37	...	480	...	(1)	4,000	2.30	82.50
Macon	23,273	155	...	480	...	(1)	4,000	2.75	100.00
Newnan	3,654	30	...	480	...	(1)	4,000	2.30	100.00
Quitman	2,281	26	...	480	...	(2)	2,600	Wood	z
Rome	7,291	90	...	480	...	(1)	4,000	2.20	96.00
Savannah	54,244	505	2	480	...	(2)	3,800	3.75	72.00
Valdosta	5,614	23	28	480	...	(2)	2,179	Wood	60.00
West Point	1,797	33	...	340	...	(2)	3,000	2.45	z
IDAHO									
Boise	5,957	44	...	480	...	(1)	4,000	W. P.	96.00
Grangeville	1,132	...	5	...	550	(1)	4,000	Wood	120.00
Pocatello	4,046	20	...	480	...	(1)	4,000	W. P.	132.00
ILLINOIS									
Abingdon	2,022	36	...	340	...	(2)(3)	1,350	1.55	55.00
Aledo	2,081	15	...	480	...	(2)(3)	1,220	2.15	72.00
Alton	14,210	125	...	480	...	(1)	4,000	s	90.00
Anna	2,618	21	...	480	...	(2)	1,825	1.50	66.00
Arcola	1,995	...	40	...	340	(2)(4)	2,100	1.90	50.00
Assumption	1,702	18	...	480	...	(2)	2,250	.90	72.00
Astoria	1,684	22	...	480	...	(2)(3)	1,220	1.60	60.00
Atlanta	1,270	24	3	340	...	(2)(3)	2,190	1.60	50.00
Avon	809	...	4	...	...	(3)	1,500	2.00	60.00
Beardstown	4,827	51	7	340	430	(2)	2,500	1.90	41.59
Belleville	17,484	156	...	480	...	(2)	2,170	.75	62.50
Belvidere	6,937	90	...	480	...	(2)	1,220	1.80	65.00
Bunker Hill	1,279	...	30	...	550	(2)(3)	1,800	1.50	z
Cairo	12,566	29	...	480	...	(3)	2,280	1.40	64.80
Cambridge	1,345	26	6	240	430	(2)(3)	1,200	1.25	48.00
Canton	6,564	125	...	340	...	(2)	2,161	1.25	48.00
Carmi	2,939	35	...	480	...	(2)	2,179	1.75	90.00
Carrollton	2,355	45	...	480	...	(2)	1,900	1.05	65.00
Centralia	6,721	73	...	480	...	(2)	2,300	1.25	...
Champaign	9,098	120	...	480	...	(1)(2)	2,400	1.00	65.00
Charleston	5,488	71	...	480	...	(1)	4,000	1.80	75.00
Chatsworth	1,038	25	6	480	...	(2)(3)	1,220	1.60	60.00
Chenoa	1,512	26	...	480	...	(2)	2,179	1.85	75.00
Chicago	1,698,575	527	1	480	...	(1)	4,000	3.15	z
Chicago Heights	5,100	48	...	480	...	(2)	2,176	2.00	100.00
Chillicothe	1,699	43	...	210	...	32(3)	1,228	1.40	45.40
						11(1)(2)	2,179	1.40	65.00

(1) All night. (2) Moon scale. (3) Midnight. (4) After midnight up to 1 or 2 P. M. The difference in time may be judged from the column showing number of hours lamps burn. z Municipal plant. * City owns entire equipment and lights are run and cared for by railway company for the amount stated. s Screenings. sl Slack.

The data given in the above table were collected by the General Electric Company, Schenectady, N. Y.

(To be continued.)

NEWS AND PRACTICE AMONG THE CITIES

Street Railways Pay for Privileges—Filters Necessary to Save Water Mains—Municipal Associations Formed—Money Saved in Removing Snow—St. Paul to Buy Sprinkling Wagons

Filter Needed to Save Water Mains

For some time past the water mains at Wausau, Wis., have been filling up with a foreign formation caused by the presence of manganese and oxide of iron in the water. The trouble has become such a serious one, interfering, as it does, with the quantity of water that passes through the mains, that steps will probably be taken on the advice of a chemist to install a filtering plant at a cost of about \$25,000.

A New Municipal League

As a result of the recommendations of a local club in Janesville, Wis., a municipal league has been formed with seventy-nine members. Mr. George S. Parker, manufacturer of the well-known fountain pen of that name, was elected president. The purpose of the organization as stated in the constitution is "to secure the use of good business principles in the management of municipal affairs and arouse public sentiment in favor of good government; to bring public sentiment to bear upon the choice of good public officials; to sustain them in the performance of their duties; to prevent the corrupt use of official position." Any voter in Janesville may become a member upon election by a majority of the members.

No Taxes for a Year

BECAUSE of an injunction secured by the Helena Water Company restraining the city of Helena, Mont., from spending any money for any purpose whatsoever, the Council voted to allow the taxpayers sixty days' grace in the payment of their taxes. Inasmuch, however, as the trouble will not be settled inside of a year, the Council may postpone the collection of taxes for an indefinite period. When the City Treasurer collects any money he transfers it to a committee of the Council which deposits it in the banks and these are enjoined from paying it out on checks. The Council considers that, as long as it cannot spend any money, it is useless to collect it to be hoarded in the banks.

Large Intercepting Sewer for Albany

THE construction of an intercepting sewer large enough to carry all of the sewage of Albany, N. Y., below the city instead of allowing it to empty into the river in front, forms one of the recommendations of Mayor Gaus in his annual message. The proposed sewer would be about 11,000 feet in length and receive the contents of the thirty-six sewers that now empty into the river. The discharge of such an amount of sewage into the river has made the river front of the city a decidedly unhealthy place, especially in summer. The proposed intercepting sewer would discharge above the mean low water mark and, during the period of freshets, the people in the lower part of the city would not suffer, as at present, from the backing up of the water in the sewers. It is proposed to build the sewer of brick and Portland cement, laid in a bed of concrete, with vitrified brick inverts. Because of the large cost of the sewer (placed at \$500,000) a portion of the work would be done each year for ten years thereby lightening the annual expense.

St. Paul to Own Sprinkling Plant

IN making preparations for sprinkling the streets of St. Paul, Minn., the coming summer and fall, City Engineer L. W. Rundlett has made specifications under which bids will be asked for sprinkling wagons. The Council has appropriated the sum of \$15,000 for a plant for the city and, while this will not provide a complete one, it is thought that a sufficient number of tanks will be secured for the

present and the next year the additional wagons will be obtained. City Engineer Rundlett wants at least seventy-five wagons in order to properly sprinkle the streets in the hot weather and, as the appropriation will not allow for this number, the specifications will be made so that both complete wagons and tanks only can be offered. When the greatest amount of sprinkling is to be done, the teamsters employed will have to furnish the running gear on which the extra tanks will be placed. Heretofore, the contractors have been paid a fixed rate per week for sprinkling, and so, did the work whether the streets needed it or not. As a consequence, the appropriation was used up long before the need of sprinkling had passed. The City Engineer is now to be the sole arbiter and can lay off at any time any number of teams which he considers are not needed. Thus, during the early spring and late fall, only a small force will be employed and enough money will be saved to put on the greatest number of teams during the hot days of summer.

Official Shake-up in Jersey City

THE new year witnessed a considerable shake-up among the officials of Jersey City, N. J. Mayor Fagan ousted the members of the Street and Water Board, which is the same as the board of public works in other cities, and appointed an entirely new set of officials. The old board was elected by the people, but a provision of the law of 1891 permitted the Mayor to appoint whomsoever he pleased. On the advice of Corporation Counsel George L. Record, who declared the old board to be illegal inasmuch as it was elected under provisions of an act that he declares is unconstitutional, the Mayor based his right to take the step. Mayor Fagan did not announce his appointments until after Mayor Seymour of Newark had gone out of office, for he was afraid that the latter would retaliate by appointing a Democratic board to take the place of the Republican one then in existence in Newark. The old board of commissioners in Jersey City has decided to contest the action of the Mayor in unseating them.

Water Purification by Ozone

THE city of Wiesbaden, Germany, has constructed extensive ozone waterworks at Schierstein for the purpose of obtaining a drinking water entirely free from pathogenic germs. The works are capable of purifying 8,829.15 cubic feet of water per hour at a cost of a little less than one-half a cent, per cubic meter (35.3166 cubic feet). The ozone, generated in an apparatus composed of metal tubes by means of electric charges, passes upward through coarse gravel contained in towers, while the water to be sterilized flows down and arrives at the bottom perfectly germless.

Good Roads in Honduras

DURING the past year road building has been the chief feature of public activity in Honduras. Because the country has had no safe or convenient highways the interior districts have been greatly retarded in their development. To remedy this a new wagon road has been built from Tegucigalpa, the capital, to San Lorenzo on the coast. The grade of this road varies between 6 and 2 per cent. In many places the road is fifty feet wide, on a foundation of lava and covered with finely beaten rock. Side ditches run along the way and nearly all the bridges and culverts are of stone. Across the large rivers no bridges have yet been built. The length of the road will be about eighty-one miles. When it is all finished it is the intention to use one side for a trolley line for electric freight and passenger cars. Abundant water power is available for supplying motive force.

Economy in Removing Snow

THIS winter the specifications for removing the snow from New York's streets were materially changed from those previously in force. Street Cleaning Commissioner Woodbury decided that the old method of paying by the load carted away was too expensive and open to chances of fraud and that the better way would be to pay for the area cleaned. The amount of surface to be cleaned was accurately measured and divided into districts and it is an easy matter for the department, through its inspectors, to determine the amount of snow and ice that the contractor removes by noting the area cleaned. The economy of this new method is shown by the expense of removing the last snow fall which cost the city about \$49,000. Under the old way the cost would have reached \$77,000. In addition to this economy, the contractor has not called on the street cleaning department for help as in the old days, and so the work of the department has not been interfered with and the ashes and garbage have been removed regularly.

Law to Protect Special Water Funds

THE Legislature of Indiana will be asked to consider a bill, designed to protect cities of the State that desire to own and operate their own water works. Mayor M. A. Brouse of Kokomo is the author. The purpose of the law is to make inviolable a fund which the council may set aside for the purchase of water plants. Ten years ago such a fund was started in Kokomo by a special tax levy and the fund reached the sum of \$43,000 when the Council appropriated \$40,000 of it to pay off a city debt and turned the rest into the general fund. As there was no law legalizing the formation of such a fund, such as there is for parks, the protests of the Mayor and citizens availed nothing. The proposed law provides that the council may levy a tax of 20 cents on the \$100 for the fund.

Houston Makes Terms with Railway

AN ordinance was recently passed by the Council of Houston, Tex., providing that the Houston Electric Company, which owns all the railways of the city, shall pay the city the sum of \$80,000 as the balance due for all claims, notes and demands of the city for grading, paving and repairing the pavements on all streets used by the company. The Company is to pay its proportionate share of paving to be done in the future. A system of universal transfers is to be instituted and vestibule cars only are to be run. Many extensions of its lines are to be made and the company must pay the city 1 per cent. of gross earnings during the next twenty-three years and 2 per cent. of the earnings during the subsequent ten years. The annual payments are not to be less than \$2,500 each. If all of these conditions are complied with, the franchise of the company is to be extended ten years from 1925, which is the date at which present franchise is to expire.

Erie Levies Tax on Pole Lines

AN ordinance to regulate the construction and maintenance of telegraph poles in Erie, Pa., has been passed by the Council. Hereafter every pole in the city, not the property of the municipality, must have upon it the name of the owner and a number, and no pole can be erected without the permission of the City Electrician who shall keep a record of the poles and each year, count and inspect them. The number of cross arms, the distance between them and the number of brackets thereon must be recorded and reported to the Mayor. The owners of all unsound poles must replace the same within two days of notification by sound ones. In addition, in April of each year, the owners of poles must apply to the City Treasurer for a license to maintain them and must pay into the City Treasury the sum of fifty cents for every pole and one cross arm and ten cents for each additional cross arm. If at any time the space between cross arms shall exceed two feet in length of the pole the excess length shall be charged a license fee of ten cents for every two feet or fraction. Any pole not lettered and numbered as provided in the ordinance is to be considered "dead" and may be removed by the city officers. A penalty of \$100 is provided for violations of any portion of the ordinance.

Railway Pays for Franchise

WHEN the street railway company of Kansas City, Kan., asked for a renewal of its franchise over two years ago, Mayor Craddock informed the officials that the road must pay the city reasonable value for it. Since that time the renewal question has been a disturbing factor in municipal affairs, but has at last been satisfactorily settled, and two twenty-year franchises, covering all the old lines and new lines to be built, have been granted. In return for the privileges of the franchises, the city is to receive 8 per cent. of the gross track earnings on all lines, the Company guaranteeing that the sum shall not be less than \$50,000 annually, minus the Company's taxes, which in 1902 amounted to \$27,000. A 100-acre park is given the city and the company is to maintain it for twenty years. The cost of electric lights is to be reduced to \$65 per year, per light. The old price being \$129.10. Two new lines are to be built as well as a 1,200-foot viaduct with a public roadway, costing \$100,000, to span the railroad yards. A universal system of transfers is to be instituted, and the company also grants all night cars on several lines, the use of the company's tracks, at reasonable rental by interurban companies entering the city, paving between the tracks and eighteen inches outside with the same material used on the rest of the street, free electric lights at crossings, damages for property injured by electrolysis, and first-class equipment including vestibules for the motormen.

A New Municipal Engineers' Association

IT is probable that, in a short time, a new association of municipal engineers will be formed in New York City. On January 20, a meeting was held by some of the chief engineers and assistants in the various departments of the city government and a temporary organization formed for the purpose of issuing a call to all the eight hundred odd engineers in the employ of the city for the purpose of forming a permanent organization. About thirty-five of those approached on the subject expressed their willingness to join in the movement. The date for the next meeting at which the permanent association will be formed had not been fixed upon when this paper went to press. Mr. O. F. Nichols, Engineer in charge of the Williamsburg bridge, was made chairman of the temporary organization and Mr. Arthur S. Tuttle, Assistant Engineer of the Board of Estimate and Apportionment, was made secretary. Mr. Max L. Blum, who was chairman of the organization committee, is to be credited with starting the movement to form the association.

Some of the aims of the association will be to bring together the municipal engineers of the departments both socially and professionally so that the problems arising in the different departments may be freely discussed. This will keep the engineers from becoming narrow in pursuing the highly specialized lines along which each department necessarily works. Other points are the systematizing and standardizing of the information in the possession of all departments, to establish uniformity in keeping engineering records, to study details of office practice, to act with other bodies in investigating municipal engineering problems, to establish a library of publications pertaining to municipal engineering, etc., and to publish information that may be of value to the engineering profession.

Among those who thus far have signified their willingness to join in the organization in addition to those already mentioned are: Messrs. Nelson P. Lewis, Chief Engineer to the Board of Estimate; Chandler Whittington, Principal Assistant Engineer to the Comptroller; John C. Waite, Assistant Corporation Council; Edward A. Miller, Chief Engineer of Parks, Manhattan and Richmond; William J. Zartman, Superintendent of Parks, Brooklyn and Queens; George S. Rice, Deputy Chief Engineer of Rapid Transit Board; Nicholas S. Hill, Chief Engineer of Water Supply, of Manhattan, Bronx, Queens and Richmond; William R. Hill, Chief Engineer of Aqueduct Commission; George R. Olney, Chief Engineer of Highways, Manhattan; Wisner Martin, Engineer of Sub-surface Structure; Horace Loomis, Chief Engineer of Sewers, Manhattan; George W. Tillson, Chief Engineer of Highways, Brooklyn; Henry R. Asserson, Chief Engineer of Sewers, Brooklyn; Josiah A. Briggs, Chief Engineer of the Bronx; James H. Johnson, Chief Engineer of Sewers, Queens; Frederick Skene, Chief Engineer of Highways, Queens; Theodore S. Oxbam, Principal Assistant Engineer of Richmond; McDonough Craven, Inspecting Engineer of the Department of Street Cleaning.

SPECIAL WATER SYSTEMS FOR FIRES

The Future Method of Fire Fighting—First Proposed in Boston—Other Cities Adopt It—Philadelphia's System the Latest and Best—New York's Need of This System

*By H. H. Easterbrook **

THE time is probably not far distant when most of the important cities having a water front will have a special water system for the extinguishment of fires with large stationary pumps at the water edge. They will pump the water and force it to the fire, instead of steam fire engines, as now, and tide-water cities will use salt water therefor in place of fresh.



SPECIAL SIX-STREAM HYDRANT IN PHILADELPHIA

Seven cities — Cleveland, Milwaukee, Detroit, Buffalo, Boston, Chicago and Philadelphia — now have such systems, except that fireboats instead of special pumps supply the water, and every one of them have been eminently successful.

Montreal, Can., and Providence, R. I., have a special water system, but supplied on the gravity plan, using the same reservoir that supplies the

general water systems of those cities. Cleveland was the first city to experiment with such a system in 1891, at the suggestion and by the efforts of the late Chief of Fire Department J. W. Dickinson. But the idea originated many years before Cleveland adopted it.

SYSTEM FIRST PROPOSED

The first official record of a movement made for the use of salt water and a series of direct-pumping stations at the water front exclusively for fire purposes was a report advocating such a system to the Boston, Mass., City Council by Councilman Henry N. Stone in 1871 at the instance of John S. Damrell, who was then chief of the fire department of that city. He recommended four pumping stations at the foot of Cambridge, Hanover, State and Dover streets, with twenty-inch mains, eight-inch branch pipes and post hydrants (Boston then and now in its congested sections used flush hydrants), each to have an outlet capacity equal to four steam fire engines.

Had there been such a system in Boston the great conflagration of November 9, and 10, 1872, would not have occurred.

Such a system for Boston was considered even before Mr. Stone presented it to the City Council, where its adoption was defeated. Back in the sixties, Chief W. T. Cheswell, then one of the permanent members of Engine 4 devised such a system and made a plan of it which he presented to the fire department officials. It took a quarter of a century to have this idea adopted. As yet there is not a complete system with pumps, etc., but Philadelphia will soon have such a complete system, thirty years after it was first suggested at Boston, or possibly earlier in some other cities.

HOW THE SYSTEM WORKS

This system, which is somewhat of the Holly direct--pumping plan,

* Editor, "Fireman's Herald," New York.

provides for a direct-pumping by sections, each section to be independent of the other but so arranged as to be connected if desired. The pressure at the hydrant outlet to be equal to or greater than that of a steam fire engine with extra large outlets and hose, the pumping engines to do the work now done by steam fire engines, hose wagons only to be used. This saves time in getting to work, and in many ways it is a much better and quicker system than that of steam fire engines, and it is claimed to be much cheaper.

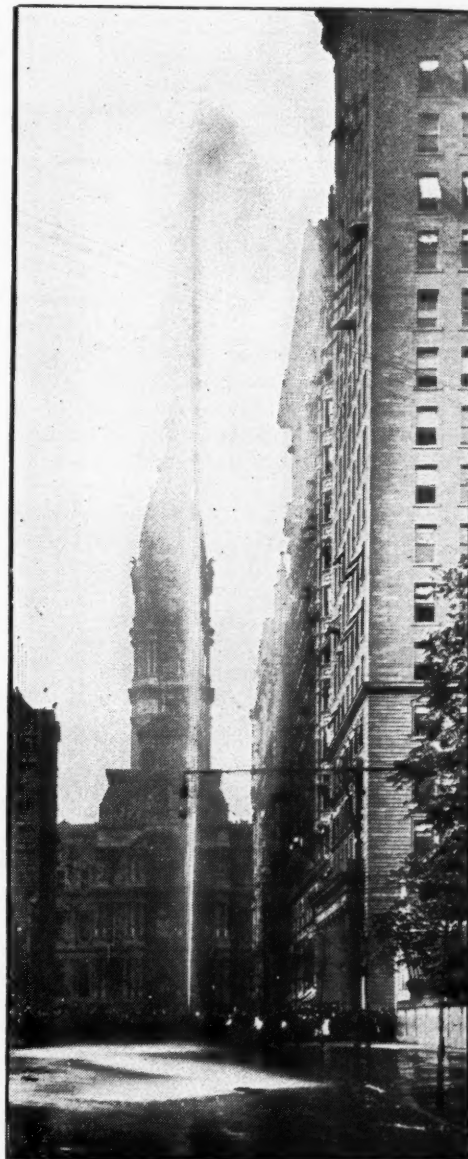
CITIES ADOPT THE PLAN

Cleveland, O., the first to experiment with this system, used it for the first time in 1891. It now has 16,500 feet 6, 8 and 10-inch extra heavy water mains, with extra heavy 4 and 6-inch hydrants, with 3½-inch outlets. It is supplied by one of the two fireboats there. Some of the mains are drained in winter, the others kept full all the time. The pressure at the fireboats, which are of 4,000 and 7,000 gallons capacity per minute, is about 250 pounds, and from 80 to 110 pounds at hydrant on elevation.

Milwaukee, Wis., was the second city to have this system in 1892. Its first experiment was with a 6-inch main, which was too small and was subsequently replaced by larger, the smallest now used on branch mains being 8-inch. There is now nearly nine miles of special system mains, with 183 hydrants with two 3½-inch outlets. It is supplied by the fireboats, and the mains are empty during freezing weather. There is communication with the boat when in service by an electric line and push button at each hydrant. It has been very much of a success in this city.

Detroit, Mich., followed in the fall of 1893, and has thirteen lines of pipe supplied by the fireboats. Special hydrants, with two 3-inch and one 4-inch outlets are provided.

Buffalo, N. Y., put such a system



TEST OF PHILADELPHIA'S SPECIAL FIRE SYSTEM—
STREAM THROWN 231 FEET THROUGH
TWO-INCH NOZZLE



SHOWING A SIAMESED STREAM FROM BOSTON'S SPECIAL WATER SYSTEM

into operation in September, 1896. It now has about a mile of 10-inch steel main, with branch pipes, and twenty-five special hydrants with large outlets. It is supplied by the fireboats, and mains are emptied when not in actual service.

Boston, Mass., where the idea originated, was the fifth to try it, and first tested its system in November, 1898. It was the first salt-water system constructed. There are some 4,000 feet of mains, with special hydrants provided with a special electric signal system to the fireboat, which provides the water. The hydrants have three 3-inch outlets each and are capable of throwing very large streams.

Chicago, Ill., on January 1, 1900, placed a small system in operation in the lumber district. Another system was constructed at South Chicago the past year. Hydrants with 3½-inch outlets are used, and the pressure is obtained of about 125 pounds. The fireboats supply the water. Another similar system is under consideration for the business section.

Philadelphia is the seventh and last city to introduce this system, and has much the best and most complete of them all. The mains are now supplied by the fireboats, but engines and pumps have been contracted for, and when ready will be located at station at Delaware avenue and Race street. There are now about seven and one-half miles of 8, 12 and 16-inch water mains, and 140 specially constructed hydrants, with two 4-inch outlets, each outlet supplying three lines of 2½-inch hose and each hydrant six lines. The mains are kept

constantly full and under 80 pounds pressure, the reservoir supplying the fresh water service now providing the pressure. The pumps ordered will have a 2,000,000-gallon per day capacity each, which will be driven by ten gas engines.

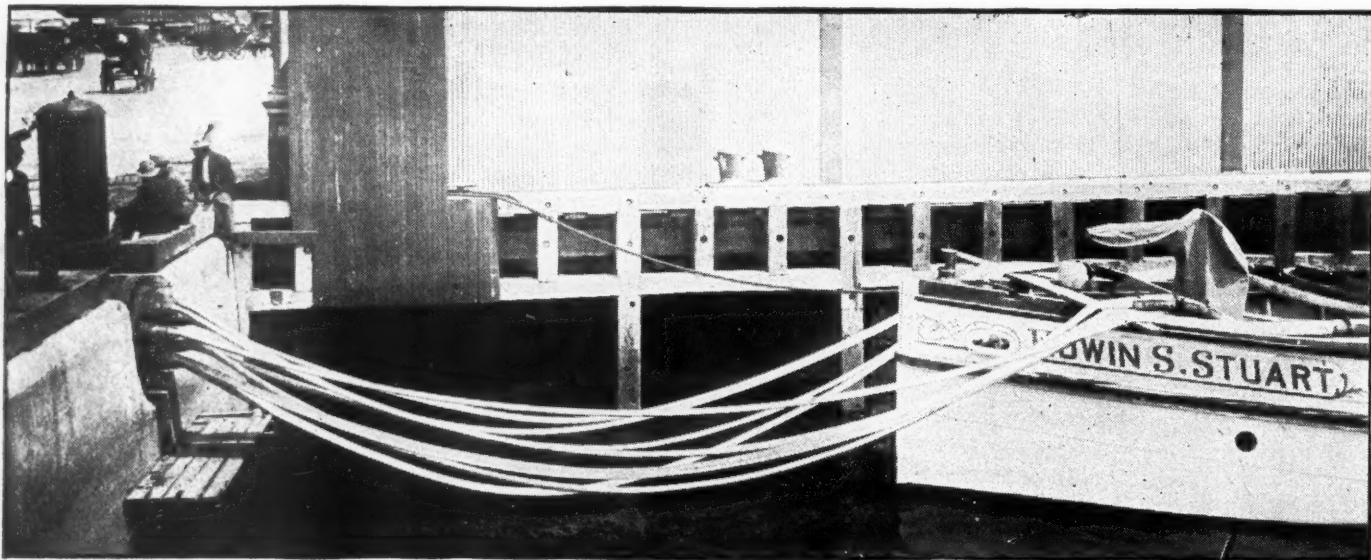
San Francisco and other cities are now considering the construction of similar systems.

They have been very successful in each city where used.

It is evident that every large city having a water front should install this system of special fire service for use in its business sections. It is surprising that no strong effort has ever been made to place this system in New York, although several chiefs have been in favor of it. New York is especially well situated for this service inasmuch as it is surrounded by large bodies of water, no portion of the city being much over a mile from either of the rivers. In the opinion of many, the salt water has an advantage over fresh for the extinguishment of fires and New York should take ad-

vantage of its position. There are millions of dollars' worth of merchandise stored in buildings that are little more than fire traps and, should a conflagration start, the water supply might become much too weak to meet the needs of the engines. This has been the case at several fires during the past year when the necessity for a special service was clearly shown. A special system of fire mains would prevent any possibility of a conflagration gaining headway and so effect a material reduction in the insurance rates.

The cost of installing these large pumping stations is such that, if they could be put to some use during the interval between large fires, the expenditure of the money for them would be more than justified. In many English cities the use of salt water for sprinkling the streets and flushing the sewers is greatly prized, the departments even paying as much as three or four times the cost of fresh water for salt. The street superintendents find that the salt water is better for laying the dust and reduces the number of times of watering. It appears to be capable of cleaning the dirt from paved streets better than fresh water and in sewer flushings those that are flushed with salt water do not require as many flushings or as much water to accomplish the purpose. If this pumping system were installed in New York City, the street cleaning department would have ample opportunity to utilize the pumps and so save in street flushing the amount of fresh water used, a valuable property during the summer months when the need of flushing is uppermost.



PHILADELPHIA FIRE BOAT CONNECTED TO SPECIAL WATER SUPPLY SYSTEM WITH EIGHT LINES OF HOSE

Fire Department No Place For Union

A NUMBER of transfers have occurred among the firemen of Toronto, Ont., due no doubt to the effort of Chief John Thompson to break up the attempt of the men to strengthen the union to which about one-third of the firemen in the department belong. He believes it prejudicial to the discipline of the department and, while he thinks that the salaries of the men should be raised, he does not think that the city can be coerced like an ordinary corporation.

In an extended conversation with a leader of the union, Chief Thompson explained his position and his determination to allow nothing to interfere with the discipline in the department. He is reported to have said in part, :

"I am avowedly in favor of organized labor, but in this direction the idea is not feasible. This force is the representative of the whole people, regardless of their ideas on the subject of labor organizations. Therefore the men should avoid taking sides on that question. Suppose, as an example of the complications which might arise, we were called to extinguish a fire in a factory where there was a strike. A force of union firemen, in sympathy with union laborers on a strike, might easily lay themselves liable to the charge of permitting a factory to be destroyed because of that sympathy.

"It is a question, in my opinion, that does not belong to a municipal department. I have talked with the men. I will not say that the recent transfers were based upon this objection, but I will say that there are other changes to be made. Our duty is to the public first. I have the interest of the force much to heart, I want to see their conditions improved, but there is a right and a wrong way to advance one's interests, and I don't consider a union the right way by a good deal in this case. Our spirit of discipline is too high to permit a retrograde movement and it will not be permitted, if I can prevent it. There is plenty of good material for firemen in Toronto."

Two Strikes Among Firemen

Two strikes have occurred among the firemen of the country during the last month. In one case, that of Houston, Tex., the trouble was settled quickly, but in the case of the one at Tampa, Fla., the situation was more serious and at present writing the trouble has not been entirely settled.

The first strike of firemen organized as a labor union took place on the 31st of December last at Houston and, as it was a hastily arranged and ill-advised affair, it did not last more than twenty-four hours. The only sympathy it had came from the labor unions. In November the firemen organized as a union and petitioned for an increase in pay. The petition was referred to a special Council committee but, as the city was greatly in debt, it was not considered wise to grant the request at that time, although nearly all were in favor of it. A few of the poorer paid, however, were to receive an advance when the committee reported to the Council, but the firemen would not wait and struck. The men agreed to serve for forty-eight hours without pay and so informed the Mayor. The firemen soon saw that they had made a mistake and the strike was called off before the forty-eight hours were up. The people were in sympathy with the increased pay but would not tolerate the drastic measures of the strike. At the next meeting of the Council an increase of pay was voted but not all that the men demanded. The custom of allowing the men to leave their post of duty to attend a labor meeting so that they could vote on the strike is one that should not have been tolerated for a moment.

At Tampa the strike occurred from different causes but the men did not have the excuse of their fellows at Houston. The men complained that they were compelled to perform menial duties for the Chief and his family and that the children of the Chief were permitted to ride on the apparatus and interfere about the fire stations. Any refusal to do any thing the Chief might ask resulted in charges or punishment of some sort. A union had been formed among the men some time ago and, in the endeavor to break this up, but with the excuse of saving expenses, Chief Harris dismissed three men, one of whom was an experienced captain. The demand to take the men back that was presented to the Council was referred to a committee for investigation, which took more than two days to the work.

The labor leader appeared before the Council and demanded that the men should be granted what they asked at once. Objection to hasty action was made by several members and the leader left the meeting and ordered the men on strike. When he returned and told the Council what he had done, both the members of the Council and the citizens condemned the act in unmeasured terms although they sympathized with the grievances of the men. Had the men waited a few days their demands would have been granted, but their deserting the stations without warning of any sort turned popular feeling against them. The other unions, of course, met and approved their action, but the best citizens volunteered to serve as firemen. The Council refused to recognize the union, and the insurance companies demanded of Council that the places of the strikers be filled at once and that none of the old members should ever be reinstated. The Council was able to fill half of the vacant places almost at once and the full quota will be secured in the near future.

Latest reports from Tampa state that the new men were rapidly learning to handle the apparatus as well as it was used by the old firemen. Some ludicrous instances are reported when the green men answered the first alarms. In one instance in particular the driver of an engine was unable to stop his horses at the scene of the fire and had to drive around the block before he had them under control.

Six Section Patrol System for New York

At last the much discussed patrol system for the New York police has been announced by Police Commissioner Greene. This system is a compromise between the two-platoon and the three-platoon systems. According to Commissioner Greene the new system is to be known as the "six-section-twelve-hour" patrol and will go into operation on January 25th. A policeman will be on duty twelve hours in each twenty-four; the rest of the day he will be at liberty. Of the twelve on duty, eight will be spent in patrolling and four in reserve, but during the latter service he will not be allowed to leave the station house except for thirty minutes for meals. From 7 p. m. to 11 p. m. the first and second sections are on patrol duty, the third on reserve and the others off duty. From 11 p. m. until 3 a. m. the second and third go on patrol, the first is on reserve and the others off duty. From this time until 7 a. m. the first and third sections patrol, the second is on reserve and the others are off. The fourth and fifth patrol are on till 11 a. m., and the sixth is on reserve. The fifth and sixth patrol until 3 p. m. and the fourth is reserved, and until 7 p. m. the fourth and sixth sections do patrol duty, the fifth is on reserve and the rest off duty. This schedule lasts for a week when the second, third and fourth sections take the night duty. After six weeks the schedule begins again. On alternate three weeks, each officer will have seven nights at home with the exception of one day in six weeks. According to Commissioner Greene, "The new schedule will provide that at all times one-third of the force will be on patrol, one-sixth on reserve and one-half off duty. This gives 50 per cent. more reserve than the three-platoon system, and it gives the same average amount of patrolling as the present system, but the amount on patrol is the same at all hours, viz., one-third of the force, instead of one-quarter of the force during the day, and one-half of the force during the night, as provided under the present or two-platoon system."

High-Pressure Fire System for Washington

THE need of a high-pressure fire service system to guard the business sections of Washington, D. C., against large conflagrations has been realized by the Superintendent of the Water Department, W. A. Macfarland, who, in his report to the Commissioners, outlines the necessary appliances for such system. The Commissioners themselves have regarded the introduction of such a system of great importance to the protection of the city from fire.

The project is to utilize the water pressure from the Reno reservoir, which has an elevation of 415 feet, by means of large trunk mains to the business sections, and by special high pressure hydrants. This system as planned can be extended as the needs require. A 36-inch trunk main should be laid which would have an effective head of water of about 357 feet, while 10,000 gallons of water per minute would flow through the mains. This amount of water is equivalent

to thirty strong fire streams through 1¼-inch nozzles. According to the experiments made by John R. Freeman of the American Society of Civil Engineers, this head of water at the hydrant would furnish an effective fire stream of 456 gallons per minute to a height of one hundred feet. Carrying a 2½-inch hose six hundred feet long to the top of a 200-foot building the pressure would be sufficient at that height to deliver a volume of 180 gallons per minute through an 1⅝-inch nozzle and throw it forty feet higher. This would hold true not only of one but of thirty such streams.

The estimated cost of this work covering the main trunk line, secondary trunk lines of 24-inch diameter, surface mains 6-inch diameter and 200 special 3-inch high pressure fire hydrants is placed at \$496,235.

Superintendent Macfarland states that an immediate result of such service would be a material reduction in insurance rates. He also quotes the experience of Providence, R. I., where a small system of this character was installed showing that while Providence secured a hydrant pressure of 196 to 267 feet, Washington would have one ranging from 355 to 385 feet. The insurance rates in the district covered by this system at Providence were reduced 5 per cent. on the introduction of the system.

One important point in favor of the system is that it will encourage the extensive use of automatic sprinklers which can be directly connected with the street mains and have an unlimited supply in case of need. A saving would also be made in the matter of apparatus, inasmuch as steamers could be practically dispensed with in these districts, and the cost of construction would be offset by the expense of these engines.

In connection with another reservoir it would serve in case any derangement should take place in the trunk line from the Reno reservoir. Superintendent Macfarland in his report has estimated the amount of pipe and other appliances necessary for the system and has submitted an estimate of the cost in detail, the total of which was given above.

Paid Fire Force for Columbia

THE time has arrived, in the opinion of Councilman William D. Melton, Columbia, S. C., for that city to place its fire department on a paid basis. He has presented an ordinance to the Council embodying the rules and regulations for a paid department and the following is an outline of what is proposed:

The department is to consist of three steam fire engines, chemical engine, hook and ladder and such further companies as the Board of Fire Masters shall consider necessary. Each steam fire engine shall consist of a foreman, an engineer, an assistant engineer, two drivers and five firemen. The ladder company is to consist of a foreman, driver and five firemen, and the chemical company, a foreman, driver and one fireman. The Board of Fire Masters is to have general management and control of the department and shall consist of the mayor and four citizens, who are to be elected by the City Council and who shall serve for four years. The Board shall have the power to elect all officers and employ all men for the department and shall make all rules for the government of the same, the power to suspend, dismiss or discharge officers and men is also vested in it, as well as the purchase of materials and supplies.

The officers of the department shall consist of chief, foreman of the several companies, and the terms of office of these officials shall be four years. Both the chief and foreman shall have all the powers of police officers of the city while going to, attending, or returning from fires. The chief must attend all fires and alarms and have sole direction of the operation of the department there. Once in every twenty-four hours he must visit each of several houses and make an inspection of the horses and apparatus. The duties of the other members of the department are such as would naturally be assigned them in any city.

The salaries of the officers and members are to be as follows: Chief, \$900 a year; foreman, \$600; engineers, \$800; assistant engineers, \$600; drivers, \$360; firemen, \$480, and the salaries shall be payable in weekly instalments by the city treasurer.

No spirituous, vinous, or malt liquors are to be permitted upon the premises of any engine, hose or truck house, and all gambling, profanity, and wrangling is to be prohibited.

No person except the officers and employees of the department are to ride on any of the apparatus going to or from fires, and fines of from five to forty dollars or imprisonment, or labor on the chain gang for five or not more than thirty days, are the penalties for violations of these rules.

The apparatus of the fire department shall have the right of way in all parts of the city, and any person obstructing the way of such apparatus shall be fined not less than five dollars or more than forty dollars, or be subject to imprisonment and labor of from five to thirty days. Similar penalties will be imposed upon all who obstruct any fire hydrant or who give, or cause to be given, a false alarm.

Automobile Police Patrol

THE use of the automobile has been gradually invading all branches of transportation where once the horse reigned supreme. Automobile fire engines have been in use for some time, but the machine has not been taken up by the police to any extent. Some three years ago the city of Akron, O., purchased an automobile patrol wagon but it had not been in service more than four or five months when it was destroyed by fire. The house in which it was located adjoined the city hall and both were burned by the mob which was bent on lynching a prisoner wrongly supposed to be imprisoned in the city hall and jail.

In Atlantic City, N. J., the Department of Public Safety has added a horseless patrol wagon to its equipment and soon only the rich and the criminals will be able to enjoy riding in an "auto;" one at their own, the other at the expense of the city. One of the fears of



AUTOMOBILE PATROL WAGON IN ATLANTIC CITY

the department is that the machine will become too popular and that the next report of the police will show a remarkable increase in petty crimes due to the desire of certain persons to take free automobile rides.

The machine is a large one, weighing about a ton and cost in the neighborhood of \$4,000. A single charge will operate it for over twenty miles and its speed is guaranteed to be eleven miles an hour. According to the calculations of the officials, the machine will be cheaper than to keep two horses in service. For the sum of \$1 it can be charged and this will last for a week or longer. The patrol wagon carries a cot, is built low and is equipped with a brake that will bring it to a standstill within its own length. Tests show that it can climb hills readily and can travel through deep snow.

WHAT POLICE AND FIREMEN ARE DOING

Detroit's Police Stations Are Models—Pittsburg to Have a Training School—Rochester Adopts Bertillon System—More Fire Apparatus Needed

Model Police Stations

THE illustrations of the police stations of Detroit, Mich., which have appeared in this and January's issue are good examples of the way Detroit houses its officers. With a trifle more money and a good bit of artistic taste the ordinary police station, such as is met in most cities, has been changed into an ornament to the city. The police force of Detroit consists of 515 men, of which 399 are patrolmen. The city is divided into seven precincts, exclusive of the substation in Belle Isle Park, which is a branch of the second precinct. Under control of the police department is the Sanitary Detail which looks after the condition of the streets, licensing of dogs, numbering of buildings, abatement of smoke nuisance defects in streets and drains and a multitude of duties which help the other departments in the enforcement of the ordinances that keep the city clean and healthy. The city is divided into nine districts for the carrying on of this work. A truant squad takes care of the enforcement of the compulsory school law and the cases of children who have committed crimes. The city sealer and the harbor master also come under the jurisdiction of the department of police. The receipts from July 1, 1901, to July 1, 1902, amounted to \$568,248.15 and the expendi-

ment of a Silsby engine, two-thirds natural size and complete in outline and general detail. The whole was illuminated with over 100 incandescent lights. A fire gong and alarm box were in front of the hall so all alarms were received there as well as at headquarters. A truck and hose wagon were kept hitched in front and the men on duty took turns in attending the ball. The programs had on the front an illustration of one of the big fires of the year and on the back a half-tone of an engine house. Chief Jesse C. Poyns headed the committees on entertainment and arrangements.

Health Board to Supervise Water Works

THE State Board of Health of Wisconsin will present a bill to the Legislature compelling all municipalities in the State to submit to the Board plans for any new water systems or supplies or sewer systems before they can be legally constructed. The Board claims that local boards of health are unable to make thorough and competent analyses of water for use in their cities. The ravages of typhoid are, consequently, encouraged instead of checked, and it would be a financial saving to the people of the State if the bill were to be passed.



FOURTH PRECINCT SUB-STATION, DETROIT, MICH.

tures were \$561,873.57, of which amount \$512,385.20 were for salaries. Commissioner George W. Fowle is at the head of the Department, while Superintendent John J. Downey has direct command of the men.

Tacoma Firemen Celebrate

THE eleventh annual ball of the Tacoma Fire Department was held the thirtieth of December and proved a greater success than was hoped for. A large attendance did honor to the occasion. The decorations were elaborate, the most striking point being a large decorative piece hung in the centre of the hall. It was a fine repre-

To Stop Selling Wages in Advance

THE practice of members of the fire and police departments of Louisville, Ky., of hypothecating their wages for months before they are due has caused the Board of Public Safety to take steps to abolish the custom. Both Chief Gunther and Chief Tyson, of the police and fire forces, are ordered to report any members of their departments who sell their unmade time for more than thirty days in advance. The practice, in the opinion of the Board, is detrimental to the men, their families and their creditors. The practice had become so general that the city treasurer paid most of the salaries to brokers.

English Fire Exhibition

Two additional groups of exhibits have been added to the schedule for the coming fire exhibition in London. Under "combustibles and explosives" will be included fuels and oils and fireworks; storage of these materials in workshops, gunpowder factories and stores; lamps and stoves. The second group will be devoted to furniture, fabrics and general exhibits pertaining to fire protection.

The Bertillon System for Rochester

SEVERAL additions have been made to the police department of Rochester, N. Y., according to the report of Commissioner of Public Safety George A. Gilman. The Bertillon system of measurements has been installed as well as a detail of mounted police. A card index system has been placed in the offices of the chief of police and director of detectives and of the commissioner of public safety. A complete record of arrests and miscellaneous reports of the officers showing the work performed by each man, are thus on file. The expenses of the department amounted to \$202,301.35. While few large fires visited the city, the delay in sending in alarms resulted in considerable loss of property. Two large engines have been added to the department and a water tower, recently purchased, will prove a valuable adjunct in fighting large fires. Additional men are asked to handle this apparatus, as it cripples other companies to detach men for this service. The expenditures for the year footed up \$257,117.

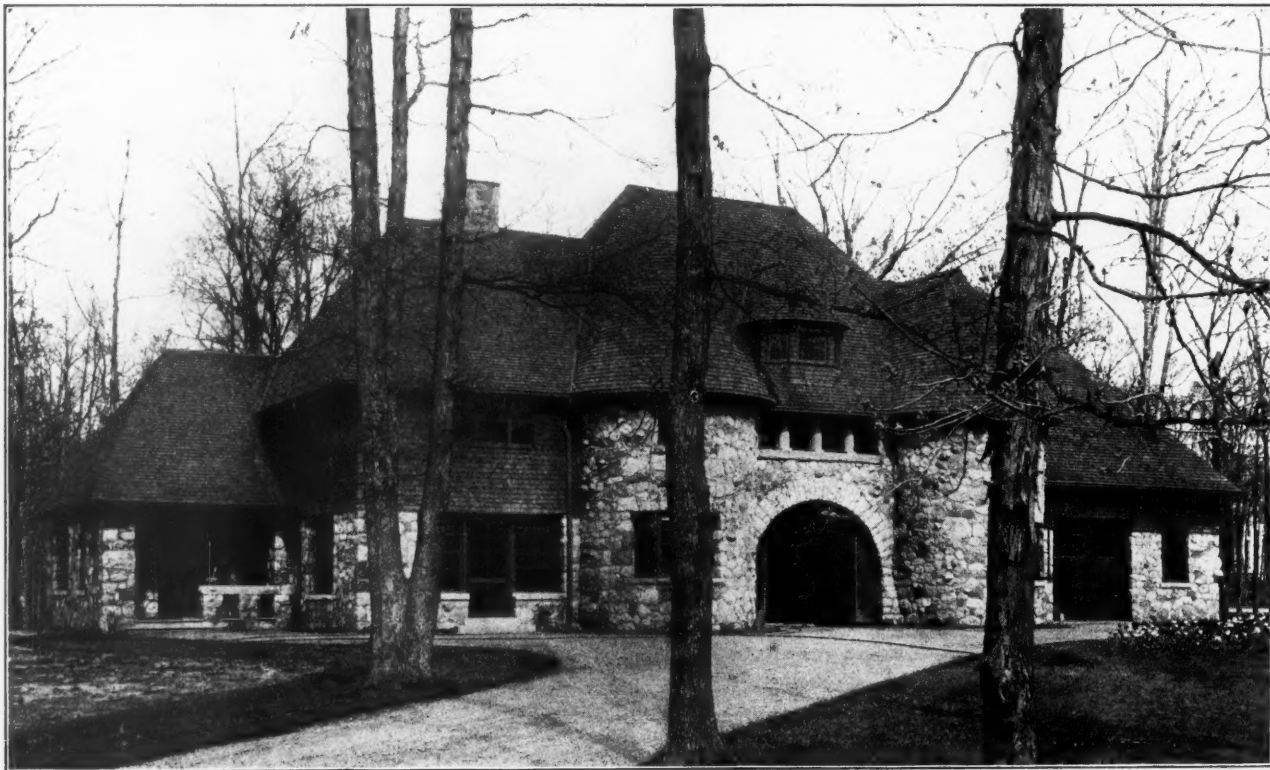
ings in the business section. Additional alarm boxes are also needed. The Board of Fire Masters adopted resolutions commending the Chief for his able management of his department, and his economy in never exceeding the appropriations.

Permanent Department at Holyoke

THE report of the work of the firemen of Holyoke, Mass., is interesting because the department was reorganized in January, 1902, on a paid basis changing from the call force. The change was not made suddenly, for work in that direction has been going on gradually for a number of years. During the year past the loss by fire was only \$29,149 and the fire commissioners attribute this small amount to the quickness with which the paid men were able to respond to every alarm. Three lives were lost through the careless use of gasoline and people are urged to use the greatest care in handling this and similarly dangerous materials. By keeping men on duty at the telephone, much dangerous delay was avoided in responding to still alarms. The commissioners recommend a new engine house and the repair and enlargement of two others. A greater water pressure is essential.

New Apparatus and Repairs Needed in York

To make the fire service in York, Pa., more effective, Chief Jacob K. Seacrist recommends that the engines be placed in a perfect state



POLICE SUB-STATION IN BELLE ISLE PARK, DETROIT, MICH.

More Water Needed in Atlanta

"WATER, and plenty of it," is what is needed by the fire department of Atlanta, Ga., according to the report of Chief W. R. Joyner. He speaks of the great value of the extra force mains laid during the year and hopes that more will be installed. The Chief also wants the fire limits to embrace the whole of the city because of great number of shingle roofs being put on buildings beyond jurisdiction of the department. There were 469 alarms involving fires in 392 buildings, over 300 of which were frame. The amount of damage estimated was \$408,592. For the coming year Chief Joyner states that \$126,931.33 will be necessary for maintenance alone. He urges better protection for the third ward of the city by the erection and equipment of a station for a hose wagon at a cost of \$7,500. A water tower and two engines are needed to protect the large build-

ing of repair and that more hose be purchased. During the last nine months of the year twenty-five general alarms and thirty-seven telephone calls were responded to by the firemen and the loss amounted to \$55,808.33, fully covered by insurance. But one fire extended to adjoining buildings. The Chief states that if some of the alarms were telephone calls to the nearest company, much expense would have been saved the department and less damage would have been done by water. He recommends that each company be supplied with three lines of hose so that there would be an opportunity to dry each line as it comes from a fire, and so keep them in good condition. There is a pressure at the hydrants of about eighty pounds, which permits of much work without the assistance of engines. Superintendent of Fire Alarm Warren E. Fastnacht recommends a subdivision of the alarm system so as to prevent all the fire com-

panies being put out of service when any part of the alarm system is broken.

Civil Service Rules for Atlanta Police

Requirements for admission to the police force of Atlanta, Ga., calculated to remove politics from that service were lately proposed by Chief J. W. Ball, but the Police Board refused to adopt them. The chief requirements are what should be demanded of applicants for all police departments and are such as tend to eliminate politics. Besides giving his physical proportions, each applicant must give the length of his residence in Atlanta, his trade and where and by whom employed for the last three years. Each application must be endorsed by three reputable citizens of the city who do not hold any city, county or state office, and who have known the applicant personally for three years and believe him to be of good moral character and orderly deportment. Educational tests will be confined to reading, hand writing, writing from memory the substance of communicated matter, arithmetic, information about the city government, location of streets and public buildings and such matters about which strangers would make inquiries. No appointments will be made except between the ages of 21 and 45, of citizens of the United States, legal voters of Atlanta only, and of no one who has ever been convicted of crime.

New Excise Law in London

On January 1 there went into effect in London, Eng., an excise law that invests the police with powers over liquor dealers and habitual drunkards such as never has been given before. Heretofore the police could not arrest anyone who was drunk unless he was disorderly, but now anyone found drunk on the street or in public places can be arrested and punished. If three convictions for drunkenness are found against any one within the space of a year, he is branded as

an "habitual drunkard," and the life of an "habitual drunkard" is to be a hard one. Any saloon keeper serving such a person is to be fined, as are all who treat him. This limit extends to a period of three years, within which an "habitual drunkard" may not secure liquor except at his peril. All clubs must file with the authorities a copy of its rules, and already clubs of all kinds are revising their regulations and some have decided to prohibit further sale of liquor on the premises.

Training School and Relief Fund for Pittsburg

ONE of the greatest needs for the fire department of Pittsburg, Pa., according to Director of Public Safety A. H. Leslie, is a training school. He desires to secure a site for an engine house of unusual size in order to establish such a school. Chief Miles S. Humphrey is quoted as saying that 50 per cent. of the men are first class men but need training in the science of fighting fires in the sky-scrapers. Hence the desire of the Director to have the men put through drills in companies. It is also the idea to give the men instruction in "first aid to the injured." While the police and firemen are supposed to know something about this work, the instruction is not given extensively by the department. It has been suggested also that a corps of Red Cross men act as an emergency squad and that these men be given thorough instruction. Instruction in the use of the water tower, scaling ladders and work on high buildings is needed by the men for no attempt has yet been made to give them this training.

Both the select and common branches of Council of Pittsburg, Pa., have passed an ordinance recreating the Firemen's Disability Board. It provides for benefits of \$15 a week for periods not exceeding one year; \$1,000 benefits in case of death or permanent injury, and the privilege of retiring on half pay after twenty years of service in the bureaus of fire and electricity. Such service is not necessarily continuous. At present there is \$95,000 in the fund.

FIRE AND POLICE PERSONALS

—Assistant Chief William Burns has been promoted to the head of the fire department of Ithaca, N. Y.

—The City Council of Wheeling, W. Va., has elected Robert D. Cline chief of the fire department by a unanimous vote.

—Chief Mason of the Memphis, Tenn., police department was presented with a beautiful gold watch as a Christmas present.

—As a Christmas gift from the members of his command, Chief Miller of the Springfield, Ohio, fire department, received a handsome Winchester rifle.

—The members of the police department of Bessemer, Alabama, presented the chief, T. B. Wallace, with a gold badge in recognition of their high appreciation.

—A solid silver carving set was the New Year's present received by Chief J. E. McGuire of the fire department of Savannah, Ga., from the members of his department.

—The police board of Schenectady, N. Y., presented Chief William L. Campbell of the department with a handsome gold badge in recognition of his thirtieth anniversary as chief of the police.

—Col. Philip Deitsch, Superintendent of Police at Cincinnati, O., died on January 23. He was a member of the police force of Cincinnati since the close of the Civil War. He was born in Bavaria in 1840.

—Mayor Worstwick of San Jose, Cal., suspended the fire commissioner and Chief Richard Brown pending charges preferred against them by a former member of the department, who alleged that he was driven from the department on account of testimony which he gave regarding blackmail.

—The Board of Police Commissioners of Atlanta, Ga., adopted resolutions recently commending the valuable services rendered by Chief J. W. Ball in preserving good order in the city on Christmas Eve. The Board also voted an increase of \$800 per year to the Chief and \$150 additional per year for each of the captains of the department.

—Chief Alfred Varian of the Bayonne (N. J.) fire department has been succeeded by John Nichols. Chief Varian became a fireman in 1883 and during his term as chief the department made remarkable

progress. Although the office was not a salaried one, Chief Varian gave it the greatest attention and never missed a fire if it were possible to attend.

—Chief of Police George W. Lutton, of Superior, Wis., has at last been removed from office by the Board of Police and Fire Commissioners. Some of the charges against Chief Lutton were the use of profane language and an attempt to bribe a member of the Board to resign. Some of the charges were not sustained, however, but a sufficient number was proved to warrant the Board in taking the step it did.

—Former Chief of Police Isaiah W. Lees of San Francisco, Cal., died on December 21st. He was born in Oldham, England, but was brought to this country when a year old. After joining the police force he was made head of the detective force and in 1897 elected chief of police. In 1899 he was retired at his own request. His work in big murder cases made him famous throughout police circles.

—Major Edward W. Hughes, who has been chief of the Lexington, Ky., fire department for twenty-two years, tendered his resignation to take effect December 31st last. Chief Hughes has been a fireman for forty-five years and will retire on a pension. Assistant Chief Filmore Tyson has been appointed chief of the department. Chief Tyson has been a fireman since 1886. Hereafter the chief will reside with his family at fire headquarters, improvements having been made in the building to permit of this.

—One day during the past month Chief James J. Mulcahey of Yonkers, N. Y., was summoned before the Board of Fire Commissioners. President Hayes of the Board in rehearsing the many years the Chief had served in the department and after praising him for the good work he had done and for the efficiency of his force, presented him with a handsome solid gold hunting case watch. On the inside was an inscription stating that the gift was from the members, the commissioners and the clerk of the fire department of Yonkers. The Commissioner also presented him with a chain made of horse hair, gold mounted. The hair was taken from the mane and tail of the first horse Chief Mulcahey drove in the department.

LITERATURE ON MUNICIPAL TOPICS

Reviews of Some Important Books—What the Magazines and Reviews Have to Say About Civic Affairs—Municipal Reports Received

Books

THE study of the life in the North and West Ends of Boston, Mass., is the subject of the volume edited by Robert A. Woods, entitled *Americans in Progress*. The resident and associate settlement workers at the South End House have contributed the various chapters to the work, each writing from long familiarity with the conditions described. Maps are included showing, by colors, types of nationality in the north and west ends of the poorer part of the city, as well as the character of the buildings and the occupation of their inhabitants. In the preface the editor states that social and municipal reform are "embarrassed by the lack of any kindling realization * * * of the actual, present truth with regard to the urban community in the thick of which the drama of their active life is set."

The purpose of this volume is to present an analysis of the congested districts of the city and to show that these districts are connected in many ways with the other portions of the city. Copies of this book may be obtained through the MUNICIPAL JOURNAL AND ENGINEER at the publisher's price of \$1.50.

THE seventh edition of *The London Manual* is replete with the large amount of information that all of these editions have contained to which is added much that has taken place during the past year. The controversies over the introduction of better transportation facilities and the acquisition by the Metropolis of the water companies have been the prominent topics in the history of the city in 1902 and much attention has been devoted to them in this edition. Description of the other undertakings of the city are given as well as of those that are projected for the coming year and readers will have a comprehensive view of what is taking place in the greatest city in the world. The government of each of the boroughs is fully explained in a concise way so that the facts and figures for which students look are placed before them. Copies may be obtained through the MUNICIPAL JOURNAL AND ENGINEER at the publisher's rate of 35 cents.

A COMPENDIUM of sanitary practice has been needed by sanitary officers, but books on this subject have been largely theoretical and dealt with the principles of sanitation rather than the practice. *Municipal Sanitation in the United States* was written by Charles V. Chapin, Superintendent of Health of Providence, R. I., to place in comprehensive form sanitary methods in vogue throughout the country. The author complains that information from some of the important cities was unattainable because the officials in those cities failed to answer inquiries or forward reports.

There are 970 pages in the volume divided into fourteen chapters. Chapter I takes up "Sanitary Organization," showing the importance of sanitation, organization in state, county and local form, and the laws and powers of the officials existing. Chapter II deals with the "Registration of Vital Statistics." "Nuisances" forms the subject of chapter III, and the next chapter takes up "Specific Nuisances" and the manner of dealing with them in different places. Chapter V is devoted to "Plumbing" and outlines the plumbing codes and the departmental powers in this respect. In chapter VI the subjects of "Water, Ice and Sewers" is treated. Considerable space is given to sewage disposal and river pollution. In chapters VII and VIII, "Dairy products" and other foods are considered and the way health departments look after them. Chapter IX, X, XI, and XII are devoted to "Communicable Diseases" in both the legal and administrative aspects as well as in regard to vaccination, disinfection, laboratory work and antitoxin. In chapter XIII, 100 pages are given over to the discussion of "Refuse Disposal." "Miscellaneous Sanitary Work" is the subject of chapter XIII in which all the minor matters of sanitation not taken up previously are discussed. There are a

number of appendices giving the forms of the different certificates used by sanitary officers in the various states.

A Manual of Drawing, by C. E. Coolidge, Assistant Professor Machine Design, Sibley College, Cornell, is published as a special help to students of drawing and which would put into a single form a system for the draughting room. The book is printed with a blank page facing every one of text, and this is for the purpose of leaving room for the student to make notes. This book is published by John Wiley & Sons, New York, at the price of \$1.00 net.

At the time when municipal art societies are springing up all over the land and "the city beautiful" is receiving so much attention, a discussion of the utilization of artificial light for decorative as well as useful purposes is especially *apropos*. A book that will assist architects and others in properly placing their means of lighting in an artistic way is *The Art of Illumination* by Louis Bell, Ph. D. This is probably the only work that deals directly with the scientific and artistic use of modern illuminants. The first three chapters are devoted to the principles which form the basis of artificial lighting. The properties of different illuminants are taken up and the chapters on electric lighting, both arc and incandescent, are full of practical information regarding their use. The lighting of the house, large buildings and streets receive attention in other chapters. Technical details of construction are eliminated as far as possible and the book tells how to make the most attractive use of those illuminants that are at hand. There are 339 pages and 127 illustrations show the different kinds of lighting appliances and artistic fixtures. Copies of this book may be obtained through THE MUNICIPAL JOURNAL at the publisher's price of \$2.50.

Students of municipal politics and civic government will be interested in Prof. William C. Morey's book on *The Government of New York*. This is not simply a text book for pupils in school, but is a guide book for those who would make a comprehensive study of the New York State institutions. The history of the administration of the New York government is the theme of which Prof. Morey treats. He begins at the beginning of things by pointing out the main elements in the government of the Dutch colony of New Amsterdam, and then follows the history of the State and city through the control of the English down to the Revolution and since that time. The chapters are devoted to the character of the State institutions, to citizenship and suffrage, to the central and local governments of the State, the administration of justice, the protection of the community, including the police power of the State and the protection of public health and morals, the support of public education, showing the growth of the educational system and the charitable work of the State law. Other points about which Prof. Morey writes are the control of economic interests, such as the protection of forests and game, the public lands, the labor and factory laws, interstate commerce, highways and canals, of the control of corporations. The management of public finances forms the subject of one chapter. This takes up taxation and collection and levying of taxes, public debts, control of expenditures, etc. There are five appendices to the book treating of chronological tables, excerpts from select historical documents, an enumeration of the political divisions of the State, synoptical review of the State government and a number of statistical tables. Preceding each chapter is a paragraph or two giving references upon which the author has based his statements. This in itself is worth the price of the volume inasmuch as one can, through the books enumerated, carry on a more extensive investigation of the history of the State, and this justifies the statement that the book is a guide to the history and administration of the government of New York. Copies of this volume may be obtained through the MUNICIPAL JOURNAL AND ENGINEER.

Periodicals

THE December, 1902, issue of the *Proceedings of the American Society of Civil Engineers*, contains the discussion on a paper presented by Mr. J. Francis Le Baron on *An Alternative Line for the Nicaragua Canal and a Proposed New Method of Dam Construction*. New York, N. Y.

The new *Sewage Disposal Plant at Grinnell, Iowa*, is described by A. Marston in the September issue of *Iowa Engineering*. In the same issue appears an article by G. W. Bissell on a *Municipal Lighting Plant at Washington, Iowa*, which contains specifications for a proposed plant which the author designed. Ames, Iowa, \$1.00 per year; 30 cents per copy.

Percival Robert Moses contributes an article to the January issue of the *Engineering Magazine on Economy in the Designing and Operation of Electric Plants*. The author mentions some points where money can be saved in the operation of electric plants. The grates for boilers and the methods of fuel burning offers an opportunity for saving considerable in the operation of all plants. The water supply is another place where economy can be exercised, and a third saving can be made in the more or less complete use of the exhaust steam from engines. Several tables are given to show the cost of machinery for electric plants and several illustrations are given of plants in which the economies mentioned are practiced. New York, N. Y., price 25 cents per copy.

The supplement to *The Surveyor* of December 26th contains a description of the Elland Public Baths with plans of the different floors. London, England, 3d. per copy.

The *Philadelphia Medical Journal* of December 6th has an editorial on *Municipal Sanatoria for Consumptives in Ontario*. Philadelphia, Pa.

In the November issue of *The Sanitarian* appears an article on the *Requirements of Sanitation*, by H. N. Bracken, Brooklyn, N. Y. Price, \$4 a year; 35 cents a copy.

The City Hospital of Akron, Ohio is the title of an article appearing in the January issue of the *National Hospital Record*. A description of the hospital and the new building is given with cuts showing the floor plans of the four stories and basement. Detroit, Mich. 10 cents a copy; \$1.00 per year.

The Water Supply of Cities and Towns is the title of an article which appears in the issue of the *Sanitary Record* for January 1st. This article is to be continued and that part in the January issue mentioned takes up the subject of London's water supply. London, England, 3d. per copy.

The Annals of the American Society of Political and Social Science for January, 1903, contains a supplement which is a monograph on *The Housing Conditions in Jersey City*, by Mary B. Sayles. It is a report of an investigation made by the writer during a year's settlement work in that city. A systematic inspection was made of every house occupied by two or more families and information gathered in 98 per cent. of all occupied apartments in the 539 houses visited have been utilized in making the report presented. The housing situation in the city is taken up, the structural characteristics of the houses, the sanitary evils, overcrowded apartments and the attendant evils, the relative distribution and cleanliness of the different nationalities, and efforts to remedy the evils are the points taken up in the monograph. A bibliography is appended to the report. Philadelphia, Pa. Price per year, \$6; per copy \$1. Issued bi-monthly.

The *Journal* of the New England Water Works Association for December, 1902, contains a number of papers of interest to city officials. *The Water Supply of Nashua, N. H.*, contributed by Horace G. Holden, Superintendent of the plant, describes the construction of the works in detail and is illustrated with some views of the

water supply. *A New Turbidimeter* is described by Charles Anthony, Jr., of England. By means of this new instrument it is hoped to escape the deficiencies of the other methods of testing the turbidity of water. According to Mr. Anthony, the instrument is simple and gives the most accurate results. *The Report of the Committee on Uniform Statistics* appears in this number. This committee has been working for some time to secure uniform water works statistics and reports that the American and the Central States water works associations have adopted their form for summarizing statistics, which has now become the standard. The need of uniform statistics not only in water works affairs but in every other branch of city government, has been felt by all who take sufficient interest to make a study of the subject and attempt to compare one city with another. The committee appointed to investigate the "proper apportionment of charges for private fire protection of the mains and controlling the supply thereto, handed in its report. The committee was not unanimous in presenting this report, one member handing in a minority report in which he called attention to the gross misuse of the fire service systems. He believes that all expense of making connection with necessary indicating devices to insure that no improper use was made of fire service pipes, should be borne by the consumer. The final report of the Committee on *Standard Specifications for Cast Iron Pipes* was presented and discussion had. The report contains numerous tables showing the various dimensions of pipe and the proper weight for certain sizes. Boston, Mass. Price \$3.00 per year; \$1.00 per copy, issued quarterly.

Municipal Reports Received

We are indebted to James Y. Player, Comptroller of St. Louis, Mo., for a copy of his last annual report of that city.

We have received a copy of the annual reports of the city of Ogdensburg, N. Y., for 1901-2.

The annual report of the Electrical Department of the District of Columbia, for 1902, has come to hand.

The copy of the twenty-eighth annual report of the Department of Public Works of Detroit, Mich., was sent us by Secretary Robert Y. Ogg.

We have a copy of the last semi-annual report of the Sewerage and Water Board of New Orleans, La.

We are indebted to Mr. Clinton Rogers Woodruff, of Philadelphia, for a pamphlet published by the Municipal League of Philadelphia, entitled "Manual of Elections as Held in the City and County of Philadelphia." This pamphlet explains all about how to vote under the election law in force in Philadelphia.

A copy of the thirteenth annual report of the Fairmount Park Art Association of Philadelphia, has been received. This report contains an address on "The Relation of Natural to Artificial Beauty and Landscape," by Walter Cope, and is illustrated by well chosen views of gardens and other park scenes in Europe.

We have received a copy of the last annual report of the State Board of Tax Commissioners of New York.

The eighteenth annual report of the Board of Fire Commissioners of Erie, Pa., has been sent us.

Chief H. J. Eaton, Fire Department, Hartford, Conn., has favored us with a copy of his last annual report.

The last report of Chief Ivins D. Applegate, of the Hoboken Fire Department, has been sent us by that gentleman.

The twenty-fifth annual report of the Water Commissioners of Middletown, N. Y., has been sent us by Superintendent T. W. Davey.

We have received a copy of the annual report of the City Auditor of Providence, R. I., for 1902.

The seventh annual report of the Public Lighting Commission of Detroit, Mich., has been received.

We have received a copy of the thirtieth annual report of the Board of Water Commissioners of Altoona, Pa.

Commissioner George W. Fowle of Detroit, Mich., has sent us the report of the Police Department for 1901-1902.

The annual reports of the departments of Halifax, N. S., for 1901-1902, have been received.

The report of the Engineering Department of the District of Columbia for 1902, including the reports of the several divisions, has been sent us.

REVIEW OF MUNICIPAL REPORTS

Stone Crusher a Valuable Acquisition—What Trees to Plant in Cities—Engineering Records Kept in Fire-Proof Vaults and Indexed Under Card Index System

Bituminous Macadam Highly Recommended

The report of the Board of Public Works of Ogdensburg, N. Y., shows that the stone crusher plant has proved a valuable acquisition in carrying out street work and has remained in good condition despite the amount of work for which it was used. The city owns two Gates stone crushers with elevator and plant complete, and also has one Springfield steam road roller. Some 1,489 square yards of tar concrete sidewalks were laid during the last year, and the commissioners were satisfied with the service they have given.

The need of paving Ford street became so urgent that the work will be carried out as soon as the kind of paving has been selected. Serious objection was raised to stone paving on account of the noise, and the commissioners consider that brick paving properly laid on concrete would be too expensive as compared with the value of the pavement on the street. They investigated, to a considerable extent, bituminous macadam paving and have recommended that the street be paved with that material. The report states, "this needs a solid foundation, but can be laid at the lowest percentage of cost according to value, of anything yet presented. The recommendations received on account of this pavement are of the highest character."

Asphalt Must Stand Water Test

The need of a union station and the abolition of grade crossings in Washington, D. C., are the first matters urged in the report of the Engineering Department of the District for 1902. The Commissioners and the railroad companies are awaiting the approval of Congress and the action of that body is requested. During the year some four and one-half miles of abandoned railroad tracks were removed at the expense of the railways.

In speaking of tree removals, the Commissioners call attention to the difficulties of growing certain kinds of trees in a city and mention the North Carolina poplar as one that does not do well, its roots growing so near the surface that they interfere with walks and curbs and it is unable to withstand storms. During the past year a record has been kept of all trees removed, showing the location, variety and nature of surroundings and the cause of removal. In a few years these records will furnish most valuable statistics.

In the building department the record has been one of activity. In all, twelve schools, a police station, a fire engine house, and additions to the hospital and workhouse have been completed. The serious condition of the Anacosta bridge is again brought to the attention of the President. The use to which this bridge has been put greatly strained it and the commissioners recommend that a larger and better bridge be built.

The material used for street pavement during the year was sheet asphalt, asphalt block and macadam. Of the sheet asphalt 50,218 square yards were laid, 29,858 square yards of asphalt block, and 40,276 square yards of macadam. For paving alleys the material used was vitrified block and asphalt block, 9,969 of the former and 18,495 square yards of the latter being laid. The specifications for asphalt paving during the year included the requirement that "the asphalt cement must be, either naturally or through artificial treatment, of such character to be unaffected by the action of water when tested as follows: "The asphalt cement shall be tested by coating it on a piece of glass and immersing this coated glass in distilled water at a temperature between 70° and 90° Fahr. The surface of the asphalt cement must remain bright and show no corrosion or discoloration after immersion for a period of seven days." Regarding the rolling or buckling of asphalt surface, the commissioners believe that the effect is due partially to the presence of soluble salts in the asphalt. These absorb moisture, loosen the grains of sand in the asphaltic mixture and cause a disintegration which softens the pavement. During the coming year, therefore, all asphalt used must be free from soluble salts.

Facilities should be provided for testing all important materials to be used in the public works of the District. Asphalts and cements are now tested by such materials as coke, coal, bricks, oils, paints, etc., should receive similar treatment.

A Magnificent Sewer System

By the time 1908 has passed, the city of New Orleans, La., will have in operation a magnificent system of sewers and water works. The last report of George S. Earl, General Superintendent of the Engineering Department of the Sewerage and Water Board, outlines the immense amount of work that has been, and must be done before the entire work is accomplished. The city covers an area of twenty-three square miles, and there will be 700 miles of streets, having when built up fully an estimated population of 860,000. The completion of the sewerage and water works system in this area will cost at least \$14,000,000. The mapping out of this work has been successfully accomplished by Mr. Earl's department. As only residents of New Orleans could be employed on the engineering force, the supply of available men for the work was so limited that more time was taken than needed to have been.

The money available by the sale of bonds was not sufficient for the immediate completion of both these systems, and so it became necessary to arrange a rate of expenditure for construction that by delaying bond issues, would save enough in interest charges, together with the proceeds of the bonds, to complete the systems in the present occupied area. Mr. Earl says that the temptation to spend money in investigating dead projects was successfully put aside and only necessary investigations were carried out. By the spring of 1901 the general plans had been formulated and the engineering department then proceeded to carry them out in detail. In showing how economically the engineering work had been done, Mr. Earl states that the usual fee of one per cent. for general plans, and one-half of one per cent. in addition for detailed plans, for engineering work, would cost the department \$200,000, while the total cost of his force was \$45,000. All maps, plans and records bearing upon the proposed work, were collected and filed. A system of "bench marks" was established and carefully verified so that no trouble would arise from them in the future. The present sewers were pumped out twice, examined, and the seepage or ground water flow into them carefully measured. Data bearing upon artesian sources were collected and approximate estimates of cost of water supplies outside of the city were ascertained. This proved that the least expensive system outside of the city would double the first cost of a water system for New Orleans.

General plans for the final distributing water systems were prepared so that in all of the seven hundred miles of streets the size of the water pipe required and the location of valves and hydrants are known. Similar work was laid out for the sewerage system, so that the size of every sewer, were the entire area inhabited, would be known. The location and general design of nineteen sewage pumping stations was determined, and an innumerable amount of detail matter worked out.

In order to protect the result of all the above work, which is of immense value to the city, the plans and records are duplicated and the duplicates are stored in a fire proof vault especially constructed for that use. They were also numbered, filed and recorded in card index form, so that all were readily accessible when needed. This involved a large amount of work, but it was absolutely essential for ready reference.

Mr. Earl reports the result of the investigations looking toward the purification of the Mississippi River. Four systems were tried and three of these gave satisfactory results; 19,000 analyses were taken of the water at different times, and under all conditions, and the expense of this investigation amounted to \$13,484.

ESCALATOR IN TRANSIT PROBLEM

First Used at the Paris Exposition in 1900—Used in New York for Two Years—Others Soon to Be Installed on Elevated and Subway Lines

EVERY great city is now coping with the problem of improving its rapid transit facilities. The congestion of various kinds of traffic on the streets renders a further development of surface lines quite out of the question and, therefore, the only remaining methods are underground and elevated railroads. As either of these latter schemes of transportation necessitates terminals and stations, either below or above the street level, the conveying of passengers to and from the street becomes a vital question although its importance has, until quite recently, been overlooked by the New York Rapid Transit Commissions and similar bodies.

An indication that this phase of the question will henceforth receive better consideration is found in the contract between the city of New York and the Subway Construction Company. Provision is made therein that where the stations of the new subway transit system are more than thirty feet, either below or above the street level, mechanical means of conveyance between the stations and street must be provided. Accordingly, the Escalator has been selected for this service.

This is by no means a new device. The Escalator has, for over two years, been demonstrating its fitness for conveying large numbers of people from one level to another, with rapidity and safety. The first Escalator in public service was installed in the Textile Building at the Paris Exposition of 1900, where it called forth favorable comment from visitors of every nation and from the technical press of Europe. The Exposition authorities, after having satisfied themselves that it would do all that was claimed for it, namely, convey ten thousand people per hour, awarded the Grand Prix to its makers, the Otis Elevator Company.

Escalators have since been installed and are now in operation in the large department stores of Siegel & Cooper, in New York and Chicago, of Gimbel Brothers in Philadelphia, and of the Simpson-Crawford Company and of R. H. Macy & Company in New York, the latter store being equipped with four separate machines, serving on the first five floors. In addition, there is an Escalator at the uptown station of the Sixth Avenue Elevated Railroad at Twenty-third street which affords the best example of its fitness for this particular class of service. Since it was installed two years ago, the receipts of this station have been increasing at a greater rate than those of any other station, showing that the public appreciates a device which saves them the trouble of going upstairs.

The inclination of the public to avoid climbing steps is well known. If, for example, during some building operation, a tem-

porary side-walk is erected a few steps above the usual level, the great majority of pedestrians show their preference by going around what they consider an obstruction. Moreover, many people in deciding by what method they shall travel from place to place within the city, consider "the climbing of steps." It has been learned, from actual observation, that considerable traffic has been diverted from the surface line at the Twenty-third Street Elevated station. This fact was clearly brought out at the time when electrical connections of the driving motor of the Escalator were being changed to take current from the third rail. The escalator was stopped, becoming, to all intents and purposes, an ordinary staircase. Those accustomed to the convenience started as usual to travel up on the escalator, but when they saw it at rest, many were observed to turn away and

to board the surface cars instead. It is also known that many ladies so plan their shopping trips as to finish at the station equipped with this device.

Influenced, no doubt, by these considerations, the Manhattan officials have drawn a plan to install escalators at several of its other stations, including both uptown and downtown platforms at Thirty-third street and at Forty-second street.

As regards the construction, the escalator consists of an endless series of steps connected together by a heavy sprocket chain which, at the proper place, engages with the driving sprocket wheel. Each step is essentially a four-wheel truck, bolted to a shaft, which, in turn, is connected to the links of the driving chain. There are two wheels at each end of the truck traveling on separate tracks, so placed that the steps remain horizontal at all points of the ascent. At the landings, at the top and the bottom, of the



THE ESCALATOR AT TWENTY-THIRD STREET "L" STATION

escalator, the trucks travel in the same plane so that the steps there become a moving sidewalk. Ample opportunity is thus given, even to the infirm, to board the device before the ascent begins and, at the top, to step off again. A traveling hand-rail moving at the same speed as the steps further simplifies its use.

Should a person fail for any reason to step off at the upper landing, a device, called a shunt, removes him from it. This consists of a box-like affair, triangular in plan, placed about ten feet from the top of the escalator with the apex pointing against the direction of the moving platform. In the lower part, set in a vertical position are two belts running backwards from the apex. Anything coming in contact with these belts is gently brushed to one side.

Every part of the escalator is made to micrometer measurements to 1/1000th of an inch by special machinery designed for the purpose.

As the result of this unusual precision, the various steps fit together so nicely that a piece of paper cannot be forced between them. To secure practically noiseless operation, the wheels on which the trucks move are deadened with lead, raw-hide pinions are used in driving gear, and the tracks are built up of wood and steel. All parts of the running gear are made of crucible cast steel, the axles and link-pins being of cold drawn steel. Each casting is subjected to a test of many times the working-strain to come upon it.

The escalator which is to be installed at the Manhattan Street station of the subway differs from those now in service, in the respect, that it will be of the "duplex type," carrying passengers both up and down. At this point the subway crosses the Manhattan Valley on a viaduct, the tracks being about forty feet above the level of the street.

The escalator is expected to come into quite general use for another class of service, namely, for carrying pedestrians over or under crowded thoroughfares. A person now crossing over at Broadway and Thirty-fourth street, for example, has to dodge the Broadway, the Sixth Avenue, and the crosstown cars, to say nothing of countless cabs and innumerable trucks. A foot-bridge extending over the elevated or a tunnel under the street has been suggested for this point, escalators being installed to carry people to and from the street.

The escalator is to be quite extensively introduced in foreign countries. Mr. Chas. D. Seeberger, the originator of the system, will sail for London early this month to complete the arrangements for equipping with escalators the stations of the new underground roads in that city.

The Work of the Fire Extinguisher

FIRE chiefs, commissioners, and other city officials will be interested in an account of a fire extinguishing test which took place on December 17th in the public square at the corner of Gansevoort Market and West Street, N. Y.

A small house, about twelve feet high, was constructed out of soft pine lumber and this was filled with kindling wood, excelsior, and paper, all of which was thoroughly saturated with pitch. After the little building was set on fire and the flames were allowed to gain considerable headway, ten gallons of oil were thrown over the whole, which augmented the volume of flames. Those witnessing the exhibition felt sure that it would take more than the power of the "Little Giant" fire extinguisher to put out the fire, but when the operators set to work, the flame, which completely enveloped the house, was snuffed out as quickly and thoroughly as the flame of a candle. The smallest size of the "Little Giant" fire extinguisher was the only apparatus used, and those present were unanimous in praising the work of the "Little Giant." It is manufactured by the Little Giant Fire Extinguisher Company, 19 Liberty Street, New York.

A Bunch of Calendars

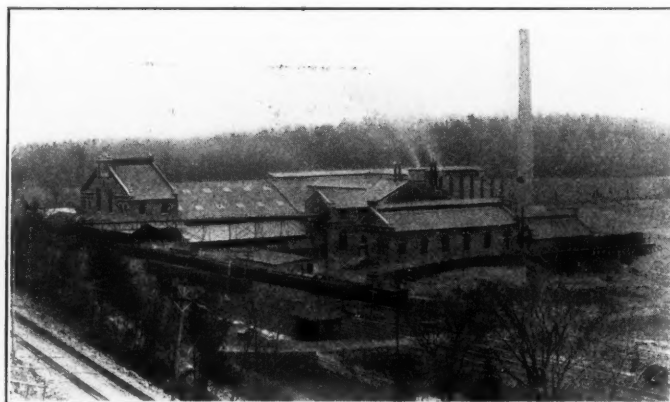
THE calendars this year have been unusually attractive. THE MUNICIPAL JOURNAL AND ENGINEER has been liberally supplied by its friends. The Christensen Engineering Company favored us with two. Two famous moonlight marine views, reproduced in color and mounted with a mat, the calendar proper being attached to the lower part of the latter. One is a lithograph reproduction of the famous painting by Tyler, and the other of the painting by Neil Mitchell. The New York Brick and Paving Company, of Syracuse, reproduced in lithograph, upon card board, the famous painting by J. G. Brown, N. A., entitled "Heels Over Head." It graphically depicts the varying expressions of interest in a group of street gamins who are witnessing the acrobatic performances of one of their number. John W. Rapp, patentee and manufacturer of what is known as the Rapp complete system of fire proof construction, 311 East 94th street, New York, put out a large sheet showing up in embossed coloring, patent fire proof floor arches and partitions, metal covered doors and shutters, electro plating in bronze and copper kalame in covered wood work. Less attractive but none the less useful calendars were received from the Pittsburgh Meter Company, East Pittsburgh, Pa., and the New York Continental Jewell Filtration Company, 15 Broad street, New York.

Bitulithic Pavement in Nashville

AFTER more than a year's investigation as to the best streets to be paved in Nashville, Tenn., Mayor Head and the Board of Public Works have fixed upon the bitulithic pavement, otherwise known as Warren's Bituminous Macadam Waterproof Pavement, as the best, most economical and serviceable pavement for the work. About 25,000 yards of this paving was laid last year and at least 100,000 square yards additional will be put down this year. A plant has been purchased and nearly all of the principal streets will be paved with it. Respecting the lasting qualities of the pavement already laid, Mayor Head said, "As far as we have been able to judge, the streets laid during the past year have proven entirely satisfactory, but of course time alone can determine their lasting quality. In other respects they have proven all that was claimed for them. We have already had several hard freezes, followed by thaws, and as far as we have been able to detect, without injurious effect upon these streets." The reports of the street paving department state that this pavement is a successful venture, the portions of streets paved with this material, looking even better than when first completed. The results of this experiment in street paving have been very gratifying to the officials.

The Alsen Portland Cement

ON the west bank of the Hudson River, at West Camp, seven miles below Catskill, N. Y., lies an inexhaustible supply of excellent cement rock which the Alsen American Portland Cement Works utilize in making their well known product. An extensive plant has been located here and the accompanying illustration shows the three buildings which are of fireproof construction, being of brick on concrete



ALSEN PORTLAND CEMENT WORKS

foundations and roofed with tile. The floors are of concrete and over 50,000 barrels of Alsen cement was exported from Germany for their construction. Expanded metal was used in the floors as well as in the foundations.

The raw material is quarried by means of Marvin drills and is brought on a tramway to the works where the cars are dumped onto an endless belt conveyor which raises the material to the third floor of the raw material building. The stone is crushed, dried in rotary dryers made by the Vulcan Iron Works, Wilkes-Barre, and then raised in a bucket conveyor to six bins. The clay is chuted into a disintegrator from which it falls into a dryer and is deposited in bins similar to those holding the stone. The material is dropped by means of hoppers to a Fairbanks weighing scale where they are mixed in the proper proportions. Four tube mills further reduce and thoroughly mix the materials. Samples are taken of the mixture and all mistakes in combining the two in the proper proportions are rectified. The mixing is accomplished by drawing the desired amount from the bins by means of a screw conveyor system that supplies the storage bins over the rotary kilns. These latter are nine in number, each six feet in diameter and sixty feet long, and were made by the Vulcan Iron Works. From the finishing tube mills the cement is elevated to the automatic weighing device that records the amount of cement manufactured. It is then raised on an elevator to the roof when it drops in chutes through the walls into the stock house which has a

capacity of 100,000 barrels. Belt conveyors distribute the material to the sixty bins used for its reception. These have hopper bottoms and a screw conveyor carries the cement to three elevators which raise it to the second floor of the packing and shipping department where it is screened to remove any foreign matter.

Electricity is used throughout for all motive power from the drills in the quarry to the end of the process. There are two electrically operated cement-dust collectors, one in the raw and the other in the finished material department. The pumping station is on the Hudson river about a mile and a half from the power house and is connected by a pole line. The quarry is about a half mile from the main building and a direct-current motor there drives an alternating-current generator of low voltage from which the drills are operated. All the buildings are lighted by electricity and all wiring is installed in steel conduits. The grounds about the buildings are lighted by arc lamps and a signal system is provided so that the current can be cut off from the various feeders from any part of the works by giving notice to the engine room. A fire-signal system is also installed, connecting all parts of the plant with the chief engineer's office. A complete private telephone system permits of connection between the various points in the plant, the offices of the company and the private dwellings of the officers. The entire plant was installed by the D'Olier Engineering Company of Philadelphia, to which we are indebted for the photograph shown. The New York office of the Alsen Portland Cement Company is at 143 Liberty street.

The Stanley Electric Largely Increases Its Stock

THE directors of the Stanley Electric Manufacturing Company, at a meeting held January 10th, passed a resolution providing for an increase in the capital stock from \$3,000,000 to \$10,000,000, and also for a meeting of the stockholders on February 11th to approve this action of the Board.

Plans for this great increase of facilities have been under way for some time in order that the company might be placed on a footing to compete with either of the two great electrical manufacturers, the General Electric and the Westinghouse companies.

Ever since the acquirement by Mr. William C. Whitney and his associates of an interest in the Stanley stock there have been rumors to the effect that negotiations were under way by which the Stanley Company would be controlled by the General Electric Company. The authoritative statement is now made that these rumors have been founded on nothing more than a misunderstanding of what really was taking place.

It will be remembered that the Stanley Company recently secured an order from the New York Edison Company, aggregating over half a million dollars for dynamos and other electrical apparatus, some of which is to be the largest of its kind ever constructed. This indication of their invading the field of heavy work is now amply verified.

Funds will be provided by this increase of capital stock for certain important developments which the engineers of the company have been planning for some time. Among these developments will be a new system for operating heavy long distance electric railways, a system which possesses marked advantage over others previously experimented with.

Notes of Interest to the Trade

—At a meeting of the Board of Directors of the Allis-Chalmers Company held January 15th, 1903, the regular quarterly dividend on preferred stock was declared.

—The Allis-Chalmers Company of Milwaukee, Wis., has just installed a new triple expansion engine with a capacity of 25,000,000 gallons every twenty-four hours, for the Detroit Water Works.

—Municipal authorities will be pleased to know that they can purchase asphalt, in its crude or refined form, from Francisco Zardain, 21 Mercaderes St., P. O. Box 652, Havana, Cuba. Cable address, "Mineral," Havana, Cuba.

—All contractors and city engineers will be interested in the 24-page catalogue, which, by the way, is the tenth annual issue, of the Archer Iron Works, of Chicago, Ill. This concern manufactures steel wheelbarrows and other utensils of interest to contractors and city officials.

—The New York Continental Jewell Filtration Company have been

asked by the York (England) Water Works to increase the daily capacity of their filter plant to 6,000,000 gallons. This company installed a filter plant with a daily capacity of 4,000,000 gallons at York last year.

—G. M. Gest, the conduit contractor, has been awarded the additional contract in Dayton, O., by the Oakwood Street Railway Company and the People's Street Railway Company for the reconstruction of their tracks in that city. This contract amounts to approximately \$15,000.

—We are advised that Mr. M. J. Burke will represent the Eureka Fire Hose Company of New York on the Pacific Coast. His headquarters will be at 573 Market street, San Francisco. He will handle all the standard brands of fire hose made by the Eureka Company and will be glad to furnish any information desired.

—The Eureka Fire Hose Company, of New York, is sending to manufacturers and others who use fire hose a very neat pocket souvenir in the way of a combination lead pencil and eraser. Write for price lists on rubber lined cotton fire hose and you will get the pencil free of cost. Their address is 13 Barclay street, New York.

—The General Fireproofing Company of Youngstown, Ohio, have issued a neat illustrated catalogue showing how it puts anybody's ideas into steel; in other words, how all the furnishings of any office, including desks, filing devices, etc., etc., may be made out of steel. The Company also calls attention to the great advantage of this sort of furniture.

—The Studebaker Manufacturing Company of South Bend, Ind., at the beginning of the New Year, presented to the Y. M. C. A. of that city \$200,000 in cash to be used in the construction of a building as a memorial to the five original Studebaker Brothers, the last one of whom, Mr. Clem. Studebaker, died last year. This munificent gift came as a complete surprise both to the citizens of South Bend, and the Y. M. C. A.

—Mr. G. M. Gest, the expert conduit contractor, has been awarded the contracts for placing underground the remainder of the overhead system of the Brooklyn Heights R. R. Company, which is being done on account of the recent order of Commissioner Robert G. Monroe. This will practically complete the removal of the overhead system of that Company within the prescribed area, and work will be finished early in the spring. These contracts amount to nearly \$40,000.

—The name of the Standard Traction Brake Co., of 26 Cortlandt street, New York, has been changed to the Westinghouse Traction Brake Company. This Company sells all power brakes for street railway service manufactured by The Westinghouse Air Brake Company, including straight or automatic air-operated brakes with axle-driven or motor-driven compressors, the storage system of air-brakes, and the Westinghouse combined magnetic brake and electric car-heating apparatus.

—The Christensen Engineering Company of Milwaukee, Wis., has opened a branch office in the Merchants Loan & Trust Building, Chicago, for the sale of its "Ceco" electrical machinery. The company has been fortunate in securing the services of Mr. Charles G. Burton as manager of the Chicago agency, who is well and favorably known in the electrical field through his previous connection with the Central Electrical Company and the Westinghouse Electric and Manufacturing Company.

—The general scarcity of coal throughout the country will make the following test at the Hotel Navarre, 38th street and Seventh avenue, of the Walker Smoke Preventing Furnace, particularly interesting to our readers. The hard coal burned during the period of twenty-four hours, December 3rd and 4th, amounted to 23,400 pounds. For a period of twenty-four hours, December 5th and 6th, 12,284 pounds of soft coal were consumed. On the dates given, hard and soft coal sold for \$4.25 and \$6.50 per ton respectively. This shows a saving of soft coal over hard coal in dollars and cents, at the rate of \$9.81 per day, which would amount to \$3,580.65 in a year. There were two loads of ashes to be carted away from the burning of the hard coal and only one load from the burning of the soft coal, and therefore a saving of \$1.00 a day, or \$365 a year, or a total saving on the price of the coal and the less expense for cartage, of \$3,945.65. The Walker furnace is said to guarantee to stop 90 per cent. of the smoke of soft coal. Robert L. Walker, Room 622, Park Row Building, New York City, is the sole owner and patentee.

LATEST NEWS FOR CONTRACTORS

Bids Wanted for Municipal Work—Franchises Granted—Contemplated Improvements— Contracts Awarded

PAVING

Boston, Mass.—Bids are wanted on February 14 for roads and walks at Fort Revere. A. M. Palmer, Q. M., 170 Summer street.

The Council has been considering the paving of Lamartine street with granite block and widening Hampton street at a cost of \$350,000.

Gloucester, Mass.—It is stated that an appropriation has been made for paving Rogers street in the sum of \$50,000. City Engineer Webber.

Hartford, Conn.—The macadamizing of Roosevelt street has been decided on by the board.

Albany, N. Y.—The report of State Engineer E. A. Bond states that 43 counties have asked for road improvements, making a total mileage of 2,007, of which 1,159 have been surveyed. At the recent meeting of the boards of supervisors in this city the sum of \$50,000,000 was recommended for the building of good roads throughout the State.

Brooklyn, N. Y.—The Brooklyn League and the Citizens' Union have demanded that the sum of \$4,000,000 be spent on paving the streets of Brooklyn. Jamaica, N. Y.—The local boards have decided to pave Academy street and Clinton and Hull avenues.

Oneida, N. Y.—Plans for the repairing of Lake Shore road have been approved by the Board of Public Works. City Engineer Vedder.

Ocean City, N. J.—The issue of bonds for paving will be soon decided and bids will then be asked. H. Steelman is in charge.

Burlington, Ia.—Valley street will be paved with brick and Washington street may soon be paved also. City Engineer Steece.

Hallet, N. C.—The Legislature will be asked to grant \$75,000 bonds issue for roads in Richmond County.

Anderson, S. C.—Contracts will be let for brick or stone paving to the extent of \$2,000 to 20,000 square yards. City Clerk B. C. Maxwell.

Lewisburg, Tenn.—It is stated that a charter has been obtained by some citizens for the rebuilding of five miles of the Franklin turnpike.

Memphis, Tenn.—Estimates are being made for the repaving of Rayburn avenue. Engineer Omberg.

Nashville, Tenn.—Estimates will be prepared on the granite paving of Bridge avenue and Front street. Board of Public Works.

Louisville, Ky.—The Board of Public Works has ordered the paving of Ash, Franklin, Milton, Clay and Floyd streets.

Rockford, Ill.—It is reported that about 27,000 feet of macadam pavement will be laid in 1903. Sixteen streets and avenues have already been fixed upon for improvement.

Springfield, Ill.—It is stated that five miles of brick and one-half mile of asphalt pavement will be laid this year. City Engineer F. H. H. Milton.

Chippewa Falls, Wis.—Bids for paving streets with shale bricks will soon be asked by the Board of Public Works.

Fort Riley, Kan.—It is reported that bids are wanted on February 16 for grading. Captain G. O. Cress, Q. M.

St. Louis, Mo.—Plans for a system of boulevard to encircle the city have been presented to Commissioner George E. Kessler.

Dallas, Tex.—It is stated that bids will be asked for the paving of Maine street.

Denver, Colo.—Reports state that grading and sidewalks are being considered for certain territories.

Oakland, Cal.—The macadamizing of Lester avenue has been recommended and plans have been prepared by the city engineer for the paving of Tenth street.

San Bernardino, Cal.—Plans for the repaving of 32nd street have been prepared by the city engineer.

San Francisco, Cal.—An ordinance has been passed for the macadamizing of 19th avenue at a cost of \$6,000. C. W. Fay, Clerk.

Jonesboro, Tenn.—A vote will be taken soon on the issue of \$100,000 bonds for public roads improvements in Washington County.

Greenville, Tenn.—The Legislature will be asked to allow the issue of \$150,000 bonds for building new pike road. S. B. LaRue can inform.

Maryville, Tenn.—A vote will be taken on the issue of \$100,000 road bonds for Blount County. Address J. M. Cates.

Rochester, N. Y.—The Seneca County Board of Supervisors have laid out thirty-five miles of road to be improved this year.

Norfolk, Va.—The street committee of the Council will consider the paving of Court street with asphalt.

Portsmouth, Va.—The street committee has recommended the asphaltting of Walter, High, County and Court streets. The work will cost from \$90,000 to \$100,000.

Huntsville, Ala.—The question of constructing new roads in Madison county was discussed at a convention recently held here.

Cincinnati, O.—Bids are wanted on February 4 for the paving of Oregon street, and brick paving on Delaney street. Robt. Allison, President Board of Public Service.

Cleveland, O.—Bids are wanted on February 3 for asphaltting Bond, Fairmount and other streets. Clerk, Board of Control.

St. Mary's, O.—It is stated that \$21,000 highway improvement bonds have been authorized.

Topeka, Kan.—The County Commissioners have decided to pave Erie street with asphalt.

Newport, R. I.—In his report to the Council, the Street Commissioner recommended that another road roller of 15 tons' weight be purchased.

Rockland, Me.—The Mayor was authorized to buy a steam road roller and rock crusher to cost about \$2,200.

New Haven, Conn.—Cedar street will be paved with crushed stone, for which purpose \$14,000 is available.

Millville, N. J.—The Council has decided to pave the streets of this place but have not fixed upon the kind of pavements to be used.

Syracuse, N. Y.—It is stated that the Council contemplates the paving of several streets with brick.

Oakmont, Pa.—The paving of the streets has been under consideration by the Council, and the citizens will soon be asked to vote on the issue of \$40,000 bonds for the carrying out of the project.

Meadville, Pa.—The Council has determined to pave State street with brick at a cost of \$14,580 complete. City Engineer W. A. Doane.

Erie, Pa.—Ordinances have been passed for the paving of 5,800 square yards of stone and 3,600 square yards of sheet asphalt, and 22,550 square yards of brick.

Charlotte, N. C.—The voters will soon be asked to vote on the proposition to build 110 miles of macadam road.

Sioux City, Ia.—The improvements this year include the paving of 61-3 miles of streets at a cost of \$295,000; 15 miles of sidewalks to cost \$50,000, and combined curb and gutter to cost \$12,000.

Portland, Ind.—Bids are wanted February 4 for 2¾ miles of gravel roads to cost \$7,200. Jay Griffith, Engineer.

Des Moines, Ia.—The Council has ordered the asphaltting of 13th street.

Menominee, Mich.—This year 20 miles of roads will be built in Menominee county.

Springfield, Ill.—It is reported that about a mile and a half of paving is contemplated.

Marinette, Wis.—The paving of several streets with brick and macadam is contemplated by the Board of Public Works. Cost, \$26,550.

Duluth, Minn.—Petitions have been presented to the Council asking that asphalt be used instead of cedar block for paving.

Gainsville, Tex.—The county has been considering the issue of \$150,000 bonds for the building of roads and bridges in the county.

Ft. Worth, Tex.—The paving of Houston street with asphalt has been under consideration.

Greenville, Tenn.—An election will be held to vote on the issue of \$150,000 road bonds for Greene County.

Fonda, N. Y.—Surveys have been made for a macadam road to be built by the State Engineer in the spring.

Binghamton, N. Y.—Press reports state that \$25,000 will be expended for road improvements.

Colesville, N. Y.—Resolutions call for 10½ miles of road. Board of Supervisors.

Johnstown, N. Y.—\$69,700 have been appropriated for 12 miles of road by the Board of Supervisors.

Riverhead, L. I.—Reports state that \$126,951 will be spent by ten towns in Suffolk County for roads.

Dansville, N. Y.—The Board of Supervisors has been considering a road from Dansville to Mount Morris to cost \$29,000.

Oak Tree, N. J.—The question of macadamizing four miles of road has been considered by the Board of Chosen Freeholders, New Brunswick.

Stewartsville, N. J.—A survey for a road has been made by County Surveyor Salmon.

Lowville, N. Y.—The County Board of Supervisors has been asked to build a road from Pinckney, a distance of 121-3 miles.

Fleming, N. Y.—The Board of Supervisors voted to build three miles of road on the west side of the lake.

Belair, Md.—The County Commissioners have been considering the building of the Woolsey macadam road from Churchville to Havre de Grace.

Jonesboro, Tenn.—The Legislature has been asked to permit an election to vote on the issue of \$100,000 bonds for roads in Washington County.

St. Joseph, Mo.—Ordinances have been introduced before Council providing for the paving of many streets with asphalt, brick and macadam.

Nashville, Tenn.—It is stated that the County Court has appropriated \$42,200 for the maintenance of roads in the county.

Ottawa, Kan.—The Council has voted to pave 8½ of the principal blocks in the town.

Springfield, Mo.—It is reported that about 4,000 square yards of brick pavement on concrete will be laid during the spring. George W. Culler, City Engr.

Vicksburg, Miss.—The question of paving a mile of the principal street with asphalt or other pavement has been considered. H. M. Marshall, Mayor of Speeds Addition, Vicksburg, Miss.

Boise, Idaho.—About three miles of cement walks has been under consideration.

San Diego, Cal.—The Street Committee recommended that a portion of 5th street be paved with asphalt on concrete base.

Sandusky, O.—Bids are wanted on February 4 for 2,715 square yards of

brick, 12,105 square yards of asphalt or macadam, and 6,440 of sandstone pavements. City Engineer J. W. Miller.

Three Rivers, Mich.—Bids are wanted on February 17 for paving Flint avenue with brick, including gutters, etc. City Clerk James E. Bunn.

Alton, Ill.—The Federal Lake Company may pave all streets with brick. E. E. Rutledge is City Engineer.

Sioux City, Ia.—Property owners in West Third street petition for brick paving on sand foundation.

Chicago, Heights, Ill.—Petition asked for paving of Illinois street with vitrified brick.

Sandusky, O.—Bids are wanted February 4th for brick, block asphalt, or other pavement on Hayes avenue. City Clerk A. M. Wagner.

WATER WORKS

Augusta, Me.—The Legislature has been asked to allow Brunswick, Gardiner and Winslow to maintain municipal water system.

Bangor, Me.—The Crompton Fire District voted \$20,000 bonds to build water works. Clerk Houston.

Framingham, Mass.—The Legislature has been asked to permit water works to be maintained.

Weymouth, Mass.—A vote will be taken on the issue of \$50,000 bonds for the water department.

Buffalo, N. Y.—In his annual report Health Commissioner Greene recommends filter beds at the mouth of the intake pipe of the water supply.

Horseheads, N. Y.—An election will be held to vote on bonds for \$100,000 water works system.

Niagara Falls, N. Y.—A committee has been appointed to secure information about water works. The City Engineer is a member.

Perth Amboy, N. J.—In his inaugural address Mayor Seamans urged the improvement of the water works.

Kingwood, W. Va.—Arrangements have been made for the installation of a system of water works for the town.

New Bremen, O.—It is stated that an issue of \$28,000 water works bonds have been sold.

Scotland, S. D.—The question of obtaining an adequate supply of water has been under consideration by the local authorities.

Waitsburg, Wash.—The question of putting in a pumping plant has been under consideration. Address Councilman J. S. Gunth.

Ottumwa, Ia.—A vote has been taken in favor of the building of municipal water works. Mayor T. H. Pickler.

Portland, Me.—It is expected that contracts will be let soon for the construction of water works for Ft. McKinley. Capt. A. W. Gates, Q. M., 185 Middle street, Portland.

Great Barrington, Mass.—A survey of the proposed water supplies has been completed by Engineer J. W. Curtis.

Cambridge, Mass.—8,000 additional meters will be required if domestic supplies are furnished with meters. A new pipe line to extend from Stony Brook to Fresh Pond is estimated to cost about \$500,000.

Brookline, Mass.—The following was authorized at the annual meeting of the town held December 30: A contract for the construction of a covered reservoir to cost \$15,000; a new pumping engine, at a cost of \$16,000; which figure was to include changes in the low pumping station. A stone crushing plant was ordered bought and a school building to be erected. Edward W. Ilaher, Town Clerk.

Pascoag, R. I.—Press reports state that the funds necessary for the construction of water works have been authorized.

Far Rockaway, L. I., N. Y.—The capital stock of the Queens County Water Company has been increased from \$500,000 to \$550,000, which will be used for extending the mains.

Oneida, N. Y.—The construction of a reservoir was recommended in the annual report of the Superintendent of Public Works D. J. Conroy.

Little Falls, N. J.—The Little Falls Water Company recently asked for a franchise to put in a water supply.

Gloucester City, N. J.—An ordinance was passed in January for the issue of \$15,000 bonds for water works improvement. Mayor Boylen.

Bayonne, N. J.—Mayor Seymour recommended a new water main on the west side in his annual address.

Watertown, N. Y.—The Water Commissioner recently decided to install a filtration plant, to cost about \$125,000.

Atlanta, Ga.—The annual report of the Water Commissioners recommended the construction of a reservoir and the purchase of a new dynamo and engine at station No. 2.

Marion, S. C.—The Marion Water, Light and Power Company has been chartered with a capital of \$100,000. J. W. Johnson, President.

Jacksonville, Ill.—A franchise for water works was granted W. F. Mahorn & Co., who will lay a 19 mile pipe line.

Menominee, Mich.—The Council has been considering the purchase of water works.

Wilmon, Mont.—Bids were asked on January 23rd for \$8,000 water works bonds. S. L. Long, Village Recorder.

Wellsville, O.—Bids are wanted February 6th for engines, pumps, boilers, etc. Board of Water Works Trustees.

Obion, Tenn.—Water and a light plant will now be put in, as the money has been subscribed.

Hennesy, Okla. Ter.—It is stated that \$10,000 water works bonds were voted recently.

Biloxi, Miss.—Bids were asked, according to reports, for \$18,000 water works bonds on January 15th.

Phillipsburg, Mont.—It is reported that \$10,000 will be spent on improving the water works.

Basin, Wyo.—It is reported that \$12,000 water works bonds were voted recently.

Brighton, Me.—The question of putting in water works has been under consideration by the Brighton Centre village.

Brattleboro, Mass.—The trouble in the pipe caused by iron rust can be remedied if cement or other lined pipes are substituted for the galvanized mains.

Chicopee, Mass.—The general installation of water meters was recommended by the Water Commissioners.

Falmouth, Mass.—It was voted recently to extend the water system at a cost of \$30,000. Samuel H. Wilmore.

Lawrence, Mass.—Mayor Grant recommended the installation of a new water filter.

Waltham, Mass.—Mayor Kermit, in his annual message, recommended that a few water meters be installed, to be followed by a gradual introduction of the system throughout the city.

Providence, R. I.—In his inaugural address the Mayor recommended that the proposed 36-inch main should be laid next year. A 20,000,000-gallon pump should be installed when the filtration plant is finished.

Brooklyn, N. Y.—The capital of the Queens County Water Company was increased by \$50,000 for the purpose of extending its mains.

Buffalo, N. Y.—Ten new boilers with mechanical stokers, etc., have been proposed for the pumping station. J. B. Cloudsley, Chief Engineer.

Gloversville, N. Y.—The Water Commissioners are planning to extend the works. J. W. Filmer, President.

Watertown, N. Y.—It is reported that a filtration plant is to be built here at a cost of \$100,000. City Engineer C. O. McComb.

Atlantic City, N. J.—It is proposed to put in artesian wells so as to add 10,000,000 gallons daily to the water supply.

Garfield, N. J.—The committee is investigating the cost of buying the water works.

Lancaster, Pa.—A committee of five will receive bids for proposed water works at a cost of \$145,000. Supt. E. F. Frailey, Water Works.

Reading, Pa.—It is reported that the Reading Suburban Water Company, 758 Penn street, will build new water works.

Oakland, Md.—A franchise for water works was recently granted F. T. Martin, Fairmount, W. Va.

Cincinnati, O.—The annual report of the Water Commissioners states that \$1,000,000 is needed to complete the works. President Herman.

Cleveland, O.—It is stated that among the improvements contemplated are construction of aqueduct, wells, a pump, etc., at the new pumping station, at a cost of \$178,000.

Elizabeth, Ill.—Plans have been completed for water works. A well, pump, engine, etc., will be needed, at a cost of \$10,000.

Rockford, Ill.—\$25,000 is included in the estimates for the water department this year.

St. Croix Falls, Wis.—It was recently voted to issue \$8,000 water bonds. Plans will be made by W. G. Kirchoffer, Baraboo, Wis.

Dillon, Mont.—An election will be held to vote on \$55,000 bonds for water works.

Joplin, Mo.—It was voted to purchase the plant of the Joplin Water Works Company. Mayor J. C. Trigg.

Golden, Colo.—\$100,000 water bonds will be issued.

Seattle, Wash.—Plans have been made for cast-iron water main and a wooden water main. City Engineer R. H. Thompson.

Toronto, Ont.—It was recently voted to issue \$175,000 bonds for a new pumping engine and water works. City Engineer C. H. Rust.

New York, N. Y.—The Board of Estimate approved the plan of Comptroller Groun for the purchase of the plant and property of the New York & Westchester Water Supply Company for \$612,385. New pumping stations must be built.

Palmyra, Pa.—Plans have been considered for bringing water 1½ miles to this place. Gabriel H. Moyer.

Utica, N. Y.—In his annual message, Mayor Talcott called attention to the need of a water supply for future use.

Columbus, Ga.—Mayor Chappell and four water commissioners form a board to supervise the new water works system, which is to cost \$250,000.

Mount Airy, N. C.—It was recently voted to build water works and an electric plant.

Bay City, Mich.—The Water Commission will put in water meters at the factories in the spring.

Ecorse, Mich.—It is reported that \$20,000 will be needed to lay water mains. President Salliotte.

Geneva, O.—It is stated that bids were received January 29th for \$5,000 water bonds. Village Clerk.

Marinette, Wis.—The question of buying the water works has been considered.

Salix, Ia.—An election will be held in the spring to vote on the construction of water works. C. E. Smith, Town Clerk.

Duncan, Ind. Ter.—It was voted recently to issue \$25,000 water works bonds.

Perry, Okla. Ter.—It was stated that \$50,000 water works bonds were sold recently. City Clerk Busch.

Natchez, Miss.—A resolution was recently adopted by the aldermen to buy the water works and sewerage plant of the Water Works Company at \$150,000. City Clerk Quarterman.

Tishomingo, Ind. Ter.—H. K. Purdon and others were granted a franchise for water works by the Council.

Rayne, La.—Bids are wanted February 2nd for a municipal water works and electric light plant. William McIntosh, Consulting Engineer, Jennings, La.

Denver, Colo.—The Denver Water Company will construct a reservoir to hold 300,000,000 gallons.

Waitsburg, Wash.—The question of building water works has been considered by the Council.

PUBLIC BUILDINGS

Fort Ethan Allen, Vt.—Bids are wanted February 20 for the construction, heating, lighting, etc., of two barracks and an officers' quarters. Capt. T. B. Lamoreaux, Q. M.

Rochester, N. Y.—A site has been selected for the new court house, which is to cost \$25,000. W. T. Tully, Chairman Board of Supervisors.

Rome, N. Y.—The officials are discussing additions to the court house.

Camden, N. J.—Contracts will be let before February 28 for a court house and jail. F. W. George, Clerk Co. Bldg. Com.

Huntington, W. Va.—Bids are wanted February 10 for two schools. Board of Education.

Albany, Ga.—It is stated that a new court house is to be built at once. The cost is placed at \$40,000.

Atlanta, Ga.—Plans have been prepared for a new prison building. \$1,500,000 is to be expended. Warden Hawk.

New Orleans, La.—The Commissioners have been trying to decide on a site for a new court house.

Memphis, Tenn.—The County Commissioners have been asked by N. C. Perkins to build a new court house.

Nashville, Tenn.—A site for a court house will be selected for a court house by a committee, of which A. B. Tavel is chairman.

Henderson, Ky.—It is stated that a court house is talked of by the city officials.

Russellville, Ky.—\$30,000 has been appropriated by the Fiscal Court for a court house. J. W. Clark, County Judge.

Cleveland, O.—It is stated on local authority that \$50,000 is to be spent on improving the Central Armory.

Boonville, Ind.—The County Commissioners have decided to erect a court house to cost \$50,000. County Clerk R. D. Mellen.

Greencastle, Ind.—The voters of Putnam County will decide on February 11 concerning the erection of a new court house.

Newport, Ind.—Bids are wanted on February 20 for an addition to the court house. William P. Bell, Auditor.

Richmond, Ind.—Plans are being made for a \$30,000 court house by the County Commissioners.

Corunna, Mich.—The Board of Supervisors has been discussing the question of a new court house for Sheawassee County.

Lawrence, Kan.—Bids are wanted February 18 for a county court house. George A. Flory, County Clerk.

Dallas, Tex.—Bids are wanted February 18 for building the U. S. court house, post office, etc., complete. J. K. Taylor, Treasury Department, Washington, D. C.

Enid, Okla.—The officials of this city have had under consideration the erecting of a new \$75,000 court house.

Decatur, Tenn.—Bonds will soon be issued for a \$10,000 court house for Meigs County.

Chattanooga, Tenn.—Bonds may be issued soon for \$100,000 city hall and in the sum of \$65,000 for new schools.

Schenectady, N. Y.—Plans have been prepared for two schools to cost about \$75,000 each.

Camden, N. J.—Carnegie has offered \$100,000 for a library building for this city and the Council has been considering the matter.

Plans for a \$500,000 court house have been under consideration by the Board of Freeholders.

Shamokin, Pa.—The Senate has passed a bill appropriating \$100,000 for a public building, and a site will be selected by a commission.

Somerset, Pa.—The city officials have been agitating the erection of a \$500,000 court house.

York, Pa.—A \$400,000 jail for the city has been discussed.

Athens, Ga.—Last month it was reported that the city wanted an architect for the \$50,000 city hall. City Engineer J. W. Barnett.

Tuscaloosa, Ala.—A site has been selected by the commissioners for the new court house.

Marion, Ind.—Plans have been prepared for a \$100,000 jail for Grant County. Bids soon wanted by the Commissioners.

Lawrence, Kan.—Plans for an \$80,000 court house have been prepared by Haskell & Gunn, architects, and bids are wanted about February 10.

Oklahoma, Okla. Ter.—It is reported that a court house and jail will be erected at a cost of \$15,000 and \$25,000 respectively.

Brooklyn, N. Y.—Plans have been prepared for a three-story brick school on Avenue K and 30th street to cost \$140,000. C. B. J. Snyder, Superintendent of School Buildings, Board of Education.

Ligonier, Pa.—It is stated that \$20,000 school bonds will be sold on February 2. H. L. McMurray, Secretary of School Board.

Pittsburg, Pa.—It is reported that contracts will be let for an addition to the Carnegie Institute to cost about \$3,500,000. President Frew, Board of Directors.

Darien, Wis.—Bids are wanted on February 2 for a high school in District 7. H. J. Heyer.

Decatur, Tenn.—It is proposed to erect an \$8,000 court house. County Clerk of Meigs County.

Yankton, S. D.—The architects for the \$40,000 court house for Yankton County are W. R. Parsons & Son Company, 317 E. Fifth street, Des Moines, Ia.

Lidgerwood, N. D.—It was reported that a new city hall for this place was proposed.

Versailles, Ky.—The erection of a brick city hall and fire engine house combined has been contemplated.

Delaware, O.—The Council has accepted the offer of Carnegie to give \$20,000 for a public library.

New Orleans, La.—Carnegie recently offered the city \$250,000 for libraries.

Philadelphia, Pa.—Carnegie offered \$1,500,000 to extend the free library system by erecting thirty branch libraries.

Worcester, Mass.—Mayor Fletcher has authorized a loan of \$300,000 for the city hospital.

Everett, Mass.—The Board of Aldermen have passed an ordinance to build a \$25,000 police station.

North Tonawanda, N. Y.—Carnegie offered \$10,000 to this city for a public library.

Marshall, Ill.—Fire destroyed the Clarke County court house.

Chattanooga, Tenn.—Plans for the \$50,000 Carnegie library are being prepared by W. T. Downing, 702 Equitable Building, Atlanta, Ga.

Lynn, Mass.—It is stated that \$30,000 bonds for a school were voted recently.

Quincy, Ill.—Bids are wanted February 25th for building a school. Board of Education.

Plymouth, Wis.—It is reported that plans have been prepared for a \$20,000 school. Secretary Rowe, Board of Education.

SEWERS

Boston, Mass.—Upon the recommendation of Mayor Collins, the Board of Aldermen passed the usual yearly appropriation of \$1,000,000 for sewers.

Hudson, Mass.—The survey for the sewerage system has been completed, and a vote will soon be taken on the question of building them.

Plymouth, Mass.—The question of a new sewer system has been under discussion at this place. The cost is placed at \$25,000.

New Haven, Conn.—Bids for the Chestnut street sewer will not be asked before April.

New Britain, Conn.—New Bids will be asked for five miles of 24-inch tile sewer and 1,048 feet of rock tunnel. William S. Caldwell, Engineer.

Brooklyn, N. Y.—The Flatbush board of local improvements will consider sewers in New York avenue, East 39th, and other streets.

Long Island City, N. Y.—The question of a 30-inch main sewer from Rockaway Park to the Far Rockaway line has been discussed. The cost would be about \$500,000.

Asbury Park, N. J.—It is reported that \$300,000 bonds will be issued, \$50,000 being for sewers.

Bryn Mawr, Pa.—The question of putting in a sewer system in this place has been under discussion.

Carbondale, Pa.—It is stated that the board of health has recommended that a sewer system be installed.

Coatesville, Pa.—The Borough Council has decided to submit the question of an issue of \$40,000 bonds for sewers to a vote of the people.

Pittsburg, Pa.—The question of sewers in Behring street, Gearing avenue, etc., has been under discussion.

Wilmington, Del.—The sewer and street directors have been discussing a sewer system for the city north and east of the Brandywine river. T. Chalkley Hatton, Consulting Engineer.

Washington, D. C.—Bids are wanted on February 14 for the construction of sewers. Commissioner H. B. F. MacFarland.

Atlanta, Ga.—The Council has been asked to appropriate \$35,000 for sewers.

Pensacola, Fla.—An election will be held to decide on the issue of bonds for the proposed sewer system. Estimates have been received. C. M. Jones, Mayor.

Athens, Ala.—It is stated that \$10,000 sewer bonds have been issued.

Akron, O.—The Council has adopted resolutions for sewers along Bluff street. Charles S. Isbell, Clerk.

Chicago, Ill.—It is reported that a site has been secured for a new pumping station for the 95th street sewer system.

Ottawa, Ill.—The question of a better sewer system for this place has been under discussion.

Rockford, Ill.—It is reported that the Council has appropriated \$14,000 for the construction of trunk sewers.

Spokane, Wash.—Bids will be asked in April for the sewer in Moscow and Idaho streets, the cost of which is placed at \$50,000.

Baker City, Ore.—Reports state that a sewer system is to be constructed in the spring.

Pendleton, Ore.—It was voted at a recent election to issue \$30,000 bonds for a new sewer. An engineer is making the plans.

Selma, Cal.—The city trustees have been considering the question of putting in a sewer system.

Marlboro, Mass.—In his annual message Mayor Morse recommended that the sewer system be increased.

New Haven, Conn.—The engineer's department have prepared plans for a new sewer, relating to the Chestnut street overflow. It will be of brick, concrete and expanded metal, for which \$13,500 has been appropriated.

Richmond Hill, N. Y.—Plans have been prepared for a sewerage system to connect with the sewage disposal plant at Jamaica. Engineer Johnson, Sewer Department, Borough of Queens.

Holly Beach, N. J.—Plans for a sewer system are under way. Councilman Forcum.

Lancaster, Pa.—Plans for a complete sewer system to cost \$250,000 have been prepared by City Engineer Carpenter.